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Skeptical Inquirer

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Are Science and Religion Compatible?

The Emptiness of Holism

SPECIAL REPORTS

The Mothman Mystery

Bioterrorism and Alternative Medicine

Published by the Committee for the Scientific Investigation of Claims of the Paranormal

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Inquiries from the media and the public about the work of the Committee should be made to Paul Kurtz, Chairman, CSICOP, Box 703, Amherst, NY 14226-0703. Tel.: 716-636-1425. FAX: 716-636-1733.

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On the cover: Benjamin Radford as Bigfoot
Cover photograph by Gary Wiepert

EDITOR'S NOTE

How Does the Evidence Stand Up on Stand-Up Creature Claims?

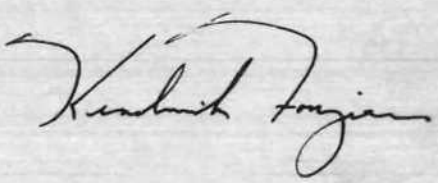
It's a charming notion. The idea that large, undiscovered, upright-walking creatures not yet known to science could be running around remote mountains or forestlands has a kind of primal appeal. Almost every culture has myths about such creatures. They emerge out of folklore and legend. Or do they perhaps arise out of real sightings? Nothing paranormal about the topic. No laws of nature need be overcome to postulate their existence—just a host of improbabilities in zoology, ecology, and population biology.

North America's contribution to the legend is Bigfoot. Interest in this supposed creature has increased over the past half century. In "Bigfoot at Fifty" in this issue, Benjamin Radford calmly reviews the evidence, major claims, and assertions about Bigfoot—from the past fifty years. He considers the chief eyewitness accounts, the footprints, films, audio recordings, and alleged hair and blood samples. He reviews the known hoaxes, which, as with the topics of UFOs and psychics, always contaminate the efforts of real research. Even Bigfoot proponents admit the field is rife with fraud. Couple all that with misidentifications. What's left? Is there genuine fire somewhere beneath all the smoke? Radford, our managing editor, gives a cool appraisal and valuable perspective to a cryptozoological legend whose fascination endures.

David J. Daegling, a University of Florida anthropologist, follows that with an examination of one particular noteworthy claim for evidence of Bigfoot—a trackway of more than a thousand alleged Bigfoot footprints supposedly left by a crippled Sasquatch or Bigfoot near Bossburg, Washington, in 1969. Several anthropologists have found these footprints difficult to explain, but in "Cripplefoot Hobbled" Daegling shows that, despite previous assertions, hoaxing them would not have been that difficult. This is Daegling's second Bigfoot-related article in SI. In "Bigfoot's Screen Test" (May/June 1999) he and Daniel Schmitt of Duke University's Vertebrate Movement Laboratory carefully examined the film images of the alleged Bigfoot walking in the famous 1967 Patterson film and found they can't be used to assert proof of the existence of a Bigfoot.

* * *

We've published two much-praised special issues on Science and Religion in the past three years. In October the Center for Inquiry held its first international conference held in Atlanta, and it had the same theme: "Science and Religion: Are They Compatible?" The conference was the first to call upon the resources of both CSICOP, publisher of the SKEPTICAL INQUIRER, and the Council for Secular Humanism, publisher of *Free Inquiry*. The conference was of very high quality and a big hit with the 500 or so attendees. Paul Kurtz's talk opening the conference—which may have some surprises for long-time followers—appears in this issue along with Benjamin Radford's impressionistic account of a few of the many conference highlights.



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'No Effect' Prayer Study from Mayo Clinic Ignored by Media

KEVIN CHRISTOPHER

A tiny Associated Press story, dated December 12, 2001, and written with barely enough copy to fill two column-inches of space in any newspaper, announced the findings of the Mayo Clinic's just-published clinical study on the healing powers of intercessory prayer. In a nutshell, the Mayo researchers could not find any evidence that such prayer affected the health of the study subjects. In fairness to AP, a story about what scientists say they did *not* find doesn't exactly burst into flames on any editor's desk (and, at least, the AP reported *something*). However, given the heavy ink poured forth at the media's altar of Medicine and Spirituality, one would have thought such findings—especially Mayo Clinic findings—might merit more attention from health and religion editors.

The study in question, conducted by Dr. Jennifer Aviles and colleagues, and led by Dr. Stephen L. Kopecky, is titled "Intercessory Prayer and Cardiovascular Disease Progression in a Coronary Care Unit Population: A Randomized Controlled Trial." Published in the December 2001 issue of the *Mayo Clinic Proceedings*, Aviles et al. found "no significant effect on medical outcomes after hospitalization in a coronary care unit."

The research involved a set of 799 Coronary Care Unit (CCU) subjects, randomly assigned to either a "prayer" group or a control group at discharge. The first name, age, sex, diagnosis, and general condition of each of the prayed-for subjects was sent by mail to a group of intercessors. Intercessory prayer was then "administered at least once a week for twenty-six weeks by five intercessors per subject. None of the subjects were aware that they were being prayed for by the study's intercessors. The primary end point after the twenty-six weeks was any of the following: death, cardiac arrest, rehospitalization for cardiovascular disease, or an emergency department visit for cardiovascular disease." Patients were also sorted into "high-risk" or "low-risk" groups for conditions such as diabetes, prior heart attacks, and other vascular problems.

Differences between percentages of patients from the two groups who succumbed to end-point events were found to be insignificant. Differences in the survival times of subjects free from other end-point complications and events were also found to be insignificant.

The study stands in contrast to the results claimed in a 1999 study of intercessory prayer on CCU patients conducted by William Harris et al. and published in *Archives of Internal Medicine*. Harris et al. claimed a significant correlation between intercessory prayer and better CCU scores on a weighted scoring system measuring procedures and cardiac events in subjects. Harris and his colleagues found significantly lower CCU scores in prayed-for patients. Irwin Tessman, a Purdue University biology professor, has faulted Harris et al., noting that the researchers constructed their study to test for speed of recovery and eventual outcome, in addition to the CCU scores, but then singled out the CCU scores in order to claim significant results. It is akin to claiming that there was only a one in six chance of having gotten a "six" after rolling the die three times. (See "Efficacy of Prayer: A Critical Examination of the Claims," SKEPTICAL INQUIRER, March/April 2000.)

In another notable contrast to the Mayo Clinic study, the research of Harris et al. immediately garnered widespread attention from the media, which often cited the work in features stories in the "Religion," "Health," and "Lifestyles" sections of newspapers across the United States. The research even landed Harris and a colleague an interview with ABC Science Editor Michael Guillen on the August 13, 2001, edition of *20/20 Downtown*. Harris chairs the Metabolism and Vascular Biology Unit at St. Luke's Hospital in Kansas City, Missouri, and is a professor of medicine at the University of Missouri at Kansas City. One item on Harris's resume that has—to my knowledge—never been mentioned in any news story is his curious position as the managing director of Intelligent Design Network, Inc. (IDNet). One mission of IDNet is "to enhance public awareness of the evidence of intelligent design in the universe and living systems." The Intelligent Design Network views ID as "an intellectual movement that includes a scientific research program for investigating intelligent causes and that challenges naturalistic explanations of origins which currently drive science

Original Article

Intercessory Prayer and Cardiovascular Disease Progression in a Coronary Care Unit Population: A Randomized Controlled Trial

JENNIFER M. AVILES, MD; SR ELLEN WHELAN, PhD; DEBRA A. HERNKE, MSN; BRENT A. WILLIAMS, MS; KATHLEEN E. KENNY, BSN; W. MICHAEL O'FALLON, PhD; AND STEPHEN L. KOPECKY, MD

mayo

• *Objective:* To determine the effect of intercessory prayer, a widely practiced complementary therapy, on cardiovascular disease progression after hospital discharge.

• *Patients and methods:* In this randomized controlled trial conducted between 1997 and 1999, a total of 799 coronary care unit patients were randomized at hospital discharge to the intercessory prayer group or to the control group. Intercessory prayer, ie, prayer by 1 or more persons on behalf of another, was administered at least once a week for 26 weeks by 5 intercessors per patient. The primary end point after 26 weeks was any of the following: death, cardiac arrest, rehospitalization for cardiovascular disease, coronary revascularization for cardiovascular disease, or an emergency department visit for cardiovascular disease. Patients were divided into a high-risk group based on the presence of any of 5 risk factors (age ≥70 years, diabetes mellitus, prior myocardial infarction, cerebrovascular disease, or peripheral vascular disease) or a low-risk group (absence of risk factors) for subsequent primary events.

• *Results:* At 26 weeks, a primary end point had occurred in 25.6% of the intercessory prayer group and 29.3% of the control group (odds ratio [OR], 0.83 [95% confidence interval (CI), 0.60-1.14]; $P=.25$). Among high-risk patients, 31.0% in the prayer group vs 33.3% in the control group (OR, 0.90 [95% CI, 0.60-1.34]; $P=.60$) experienced a primary end point. Among low-risk patients, a primary end point occurred in 17.0% in the prayer group vs 24.1% in the control group (OR, 0.65 [95% CI, 0.20-1.36]; $P=.12$).

• *Conclusions:* As delivered in this study, intercessory prayer had no significant effect on medical outcomes after hospitalization in a coronary care unit.

Mayo Clin Proc. 2001;76:1192-1198

CCU = coronary care unit; CHF = congestive heart failure; CI = confidence interval; CV = cardiovascular; ED = emergency department; IP = intercessory prayer; MI = myocardial infarction; OR = odds ratio

education and research."

In his editorial for the December 2001 issue of the *Mayo Clinic Proceedings*, Harold G. Koenig, M.D., notes that the prayer effect, if found to be true, "would indeed challenge our understanding of the universe and perhaps even overturn much scientific knowledge accumulated to date. Not only are there scientific difficulties with such a finding, there are also theological ones. Thus not only would most scientists expect a null result from such a study, but most Western theologians would as well."

Koenig makes a good point, but he is overly charitable to intercessory prayer proponents. For all the research done on prayer, it seems that researchers have no real understanding of just what exactly it is that they're trying to test. Discussion inside and outside the medical journals often speculates on concepts like the "dosage" of prayer and the influence of "background" prayer. But such ideas carry absolutely no cognitive content other than a vague—and misapplied—analogy. Certainly, medical researchers can quantify and demonstrate the application of a drug or a surgical technique, but what about a petition to a deity? How do William Harris or Dr. Stephen Kopecky know that the prayer has been heard, by whom it has been heard, or whether it is acted on, and in what way? In such double-blind studies, the researchers are merely attempting to relate the private speech acts of strangers with measures of health and recovery in study subjects. There is a huge, gaping hole in theory and evidence between these two phenomena.

In interviews Dr. Larry Dossey, author of *Healing Words: The Power of Prayer and the Practice of Medicine*, compares intercessory prayer research to the evolution of medical science's understanding of certain pharmaceuticals. Dossey reasons that since doctors had evidence that drugs like aspirin and penicillin worked long before they began to understand *how* they worked, positive results in intercessory prayer studies should be taken seriously even though there is no explanation of how prayer works.

Dossey's argument is misleading. Penicillin and aspirin are tangible, quantifiable pharmaceuticals. Researchers knew clearly whether these agents had been administered to subjects or not. Even when the exact explanation of either's efficacy had been lacking, it had still been very probable that the eventual answer would be subject to the increasingly detailed and independently verified theories of chemistry and biology.

Donald Sandweiss, M.D., observes: "Harris et al. state that their purpose is not to speculate on mechanisms, but rather to convey results. This approach seems to miss the heart of the issue. It is the very improbability of the mechanism that raises doubts concerning the validity of the results" ("P Value Out of Control," *Arch. Int. Med.* Vol. 160, No. 12, June 26, 2000). Sandweiss cites recent cautions about overreliance on P values (the probability of results occurring by pure chance) to gauge a study's value. Which is more likely: that 500 years of science are about to be overturned or that researchers can squeak by an arbitrary benchmark to claim a correlation between things that have no real relationship at all?

Kevin Christopher is Public Relations Director for CSICOP.

UFO Conspiracist William Cooper Killed in Gunfight with Police

Milton William Cooper, 58, a UFO conspiracist, tax resister, and "militiaman," was killed in a gunfight with Apache County, Arizona, deputies during the early morning of November 6, 2001.

Cooper burst upon the UFO scene in 1988 with spectacular claims about a UFO incident he said he witnessed aboard ship while in the Navy. He claimed he saw "a huge disk rise from beneath the ocean, water streaming from the air around it, tumble lazily on its axis. . . . It was a metal machine, of that there was no doubt whatsoever." He also claimed to have been a permanent member of a Naval Intelligence Briefing Team (highly unlikely for an enlisted man), which allegedly dealt with UFO matters. He spiced up his yarns with wild tales about MAJI, MAJIC, The Blue Team, and other supposed government programs associated with UFO contact. He even talked about "Project Luna," at first supposedly an alien base on the far side of the Moon, which he later claimed was actually an underground military base near Dulce, New Mexico.

About ten years ago, Cooper was a fixture at many UFO and conspiracy-related conferences. I attended his lecture at a 1991 conspiracy conference in Atlanta which he claimed that "within two years" the New World Order would take over U.S. sovereignty and suspend the Bill of Rights (see "Psychic Vibrations," SI, Spring 1992, p. 249).

It didn't take long for the UFO mainstream to turn against Cooper. He had come out of nowhere telling grossly sensational stories, and yet was quickly eclipsing those who had been laboring for decades to gain public acceptance for stories only a bit less outlandish. A little investigation quickly showed how Cooper's tales were not only implausible and unsubstantiated, but had significantly changed over time. Don Ecker of *UFO Magazine* ran a series of exposés on Cooper in 1990. Worse yet, Cooper acquired a reputation for belligerent and abusive behavior, and was reported to be drinking very heavily. He began to make slanderous attacks and false accusations against those who questioned his stories. Within a few years, Cooper had been marginalized in mainstream UFOlogy and turned his attention more toward politics, although UFOs and Area 51 remained part of his overall message. UFOs were supposed to have been invented by Nazis, and were being used by the U.S. government to stage a mock alien invasion to establish the one-world government of the New World Order.

Cooper found another large and gullible audience in the militia movement of the extreme right. He had a

regular shortwave radio program, the *Hour of the Time*, heard on WHRI, World Harvest Radio International from Indiana. Cooper's wide-ranging broadcasts blamed the federal government for the 1995 Oklahoma City bombing, as well as for the World Trade Center attack this past September 11. One of his last programs was titled "The Bush-Bin Laden Connection." According to James Nichols, brother of Oklahoma City bombing co-defendant Terry Nichols, Cooper's broadcasts were a major influence on Oklahoma City bomber Timothy McVeigh.

Cooper had been a fugitive for three years after failing to appear in court on tax-evasion charges. (His Web site, www.williamcooper.com, still makes the claim that the IRS has "no authority" and "no jurisdiction.") He was broadcasting his shortwave program from an armed compound near Eagar, Arizona, near the eastern edge of the state. Local and federal law-enforcement officers were wary of attempting to arrest him there. Knowing that Cooper was heavily armed and had vowed that he would not be taken alive, they feared provoking a bloody incident. According to Glenn Jacobs, a local newspaperman who knew Cooper, "he kept an AK-47 just inside his front door by a magazine rack."

Last July Cooper was reported to have recklessly threatened to shoot a local citizen without provocation, even following the man back to his house. This resulted in a warrant for his arrest. According to *The Arizona Republic* (Phoenix, November 7, 2001), on the night of November 5 a group of undercover police officers attempted to draw Cooper out of his house. They planned to arrest him when he walked outside. However, Cooper surprised them by driving, not walking, the short distance to where they had gathered. A second police vehicle attempted to block his return to the house, causing him to drive off the road, where he attempted to run over an officer who was on foot. Near the door of his house, Cooper turned toward the officer who was urging him to surrender, shooting him in the head and wounding him seriously. Another officer returned fire, killing Cooper (see www.azcentral.com/news/articles/breaking/1107cooper07.html).

Cooper's 1991 book *Behold a Pale Horse* remains a classic among conspiracy buffs. The book lacks a clear organization, simply moving from one dire alarum to the next in chaotic fashion. It warns of a "New World Order" being foisted upon us by a secret government, whose powers will be enhanced by sacred relics such as the Holy Grail, the robe of Jesus, and the Spear of Destiny, still being guarded by a secret surviving branch of the Knights Templar. This book contains the complete text of the notorious anti-Semitic hoax document *The Protocols of the Elders of Zion*. Cooper adds in a note that "any reference to 'Jews' should be replaced with the word 'Illuminati'," but the trick is not convincing.

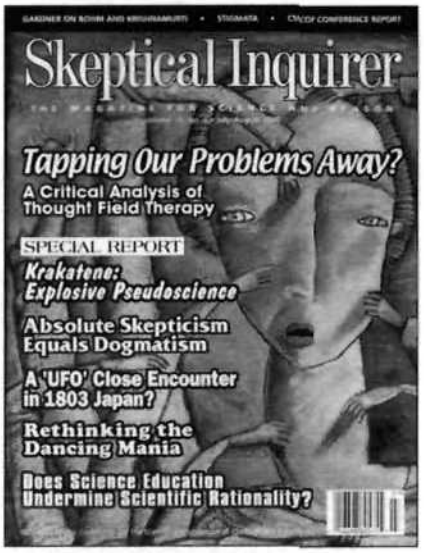
Even after his death, many UFOlogists still are defending Cooper as someone who had valuable insights, despite his admitted unreliability and violently unstable behavior. As is now well known, "big lies" are remembered long after little ones have been forgotten, and hence William Cooper's legacy will be with us for a long time.

—Robert Sheaffer

Robert Sheaffer writes our "Psychic Vibrations" column. His most recent book is UFO Sightings: The Evidence *(Prometheus 1998).*

New Developments in the Thought Field Therapy Saga

Callahan Techniques-Thought Field Therapy (TFT) was created by clinical psychologist Roger Callahan in the 1980s and first marketed as a rapid treatment for phobias (see *The Five Minute Phobia Cure* 1985). In the intervening years, TFT theory and practice has been expanded to encompass just about every psychological disorder and even many physical maladies. The treatment is a kind of psychological acupuncture in which therapists instruct clients to tap on various body parts, which is supposed to correct imbalances in the person's "energy meridians." Callahan claims already to have trained more than 5,000 clinicians in these procedures. Others have taught many more their own flavor of "energy therapy" over the Internet (e.g., see www.emofree.com).


Skeptical Inquirer
Tapping Our Problems Away?
A Critical Analysis of Thought Field Therapy
SPECIAL REPORT
Krakatoa: Explosive Pseudoscience
Absolute Skepticism Equals Dogmatism
A 'UFO' Close Encounter in 1803 Japan?
Rethinking the Dancing Mania
Does Science Education Undermine Scientific Rationality?

Readers of SKEPTICAL INQUIRER were first introduced to the questionable practices of thought field therapists by Scott Lilienfeld and Jeffery Lohr (March/April 2000 issue), who reported on recent rulings against TFT by the psychological community. I co-authored a more detailed analysis of TFT in the following issue (July/August 2000 with James Herbert), noting the absence of any credible scientific evidence to support the dramatic claims of proponents.

The publication of our SI article sparked a debate over TFT on the list serv of the Society for the Science of Clinical Psychology, and Callahan was invited into the forum to respond to critics. Callahan claimed to possess data to support his assertions but argued that the scientific community was biased against him, and therefore his work

would not pass peer review.

During the debate, Larry Beutler, editor of the *Journal of Clinical Psychology* (*JClP*), made Callahan an unprecedented offer. Beutler would allow Callahan to publish in the journal five articles of his choosing that demonstrated evidence of TFT's efficacy, but with one stipulation. Attached to each article would be a "disclaimer" noting that the articles were not peer-reviewed and indicating the special circumstances under which they came to be published. In addition, peer reviews/critiques would follow each article.

Callahan agreed to these conditions and the special issue of *JClP* devoted to TFT appeared in October 2001 (Vol. 57, No. 10). Callahan could claim no longer that the established scientific community was suppressing his research because Beutler published the articles without peer review as a gesture of good faith. In summary, none of the papers in the special issue presented controlled research that would support the incredible claims of TFT proponents. Instead, Callahan and his colleagues presented a number of case studies, all of which lacked any controls for confounding factors such as natural remission of symptoms, placebo effects, and the numerous other "non-specific" therapy effects that are often responsible for the benefits observed in psychotherapy. Not surprisingly, all of the reviews were extremely critical and concluded that they would not have recommended publication based on the normal peer-review process.

In our original SI article, we asserted that TFT had many of the characteristics of pseudoscience. This was further reinforced when examining the *JClP* articles on TFT. All but one of the articles reported positive changes following TFT treatment on a measure of autonomic regulation, called heart rate variability (HRV). If used appropriately, HRV can be a valid scientific measure. In his article in the special series, John Kline, clinical psychologist and psychophysiologist at Florida State University, stated that the HRV data in these reports most likely were indicative of statistical artifact and erroneous interpretation, and concluded that this information provided no evidence for the efficacy of TFT.

An article in the *JClP* special issue by clinical psychologists Gerald Rosen and Gerald Davison warned of the problem of "echo attributions," in which a proponent attributes his own claims to the journal in which it appears, and predicted that this might be one undesirable result of publishing the special series on TFT. These fears were borne out. Right before the October issue was published, a message was sent to a public listserv announcing that *JClP* was publishing articles on TFT and that several were being made available on Callahan's commercial Web site (see www.tftrx.com). In the reprinting of the TFT articles, Callahan excluded the critiques and, more important, the disclaimer that was supposed to appear on each manuscript.

Upon discovering how Callahan was misrepresenting the articles on his Web site, Beutler, backed by the journal's publisher Wiley, requested that the disclaimer be reprinted along with the articles in accordance with their initial agreement. Callahan has since complied with Beutler's request but not surprisingly has chosen not to make the critiques of the articles available on his Web site.

The special issue of *JClP* was intended to address Callahan's complaint of being mistreated by the scientific community by allowing him to publish evidence for TFT claims. However, the above example of selective reprinting demonstrates how such good intentions can backfire and, in this case, ultimately may result in priceless free advertising for TFT. Callahan and colleagues are promoting the fact that articles on TFT have been published in a prestigious scientific journal. Some in the scientific community fear that the public will be misled by the promotion of the special issue by Callahan into believing that TFT is backed by sound clinical science, which it still is not.

—Brandon A. Gaudiano

Brandon Gaudiano, M.A. is pursuing his doctorate in clinical psychology at MCP Hahnemann University in Philadelphia.

Lab Experiments Demonstrate Social Transmission of Paranormal Beliefs

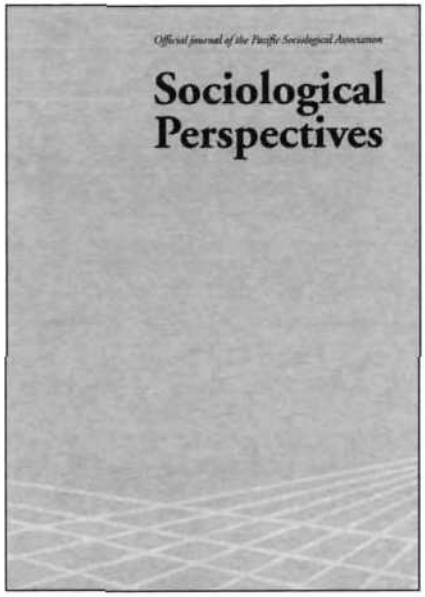
Two social scientists have published what they believe is "the first experimental demonstration of the interpersonal transmission of paranormal beliefs."

It is also, they say, the first time that a sociological theory known as social impact theory has had all three of its source factors—strength, immediacy, and number—tested in a single controlled experimental setting. Their study is published in *Sociological Perspectives* (Vol. 44, No. 1, 2001).

National surveys find broad public support for all manner of paranormal, supernatural, and occult beliefs. Some scientists tend to view this as a social problem caused by lack of critical thinking skills, fads, need for transcendent experiences, failure of the education system, and so on. Psychological explanations emphasize sensory, perceptual, cognitive, and experiential processes.

Social impact theory, says Barry Markovsky of the Department of Sociology at the University of Iowa, Iowa City, provides an alternative focus: it views paranormal beliefs as a natural consequence of social influence processes—in effect, such beliefs are passed from person to person, individually and in small groups.

This provides a kind of in-between level of explanation, he says, in contrast to the "micro" factors of cognition and information processes and the "macro" interests in cultural, institutional, and



social structural processes.

Social impact theory holds that changes in beliefs or behavior are affected *by the real or implied presence or actions* of other individuals. The social impact of a message source comes, so it is assumed, from three factors: the number of other people, their strength or status, and their immediacy or closeness.

Markovsky and colleague Shane R. Thye of the University of South Carolina decided to carry out a controlled laboratory test to understand the basic mechanism through which social factors operate to influence belief. A total of 199 subjects participated in tests at the University of Iowa under five experimental conditions.

Subjects in the experiment were informed that some people believe pyramid-shaped structures harness a mysterious form of energy that preserves objects stored within them. Subjects completed a twenty-item Paranormal Beliefs Questionnaire before the start of a session and then were given oral instructions that included a brief review of "evidence" for a pyramid's special powers. They were told that the previous week the experimenters had selected two equally fresh bananas and one was put under a pyramid and one under a box. They then were asked to rate them on five characteristics.

In fact the bananas used in all conditions were virtually identical, as rated by five judges.

In some sessions, another person, a "confederate" of the experimenters, posed as a second subject. The confederate gave predetermined responses about the perceived freshness of the banana, always rating the one under the pyramid as fresher than the one under the box.

The hypothesis was that when a confederate states that the banana appears fresher, the subject's judgment should move toward that view. The results supported the hypothesis: The pyramid banana was rated significantly fresher in the confederate condition. Factor analysis showed that the support for the hypothesis was strong. The confederate influenced the subjects' judgments to a significant degree, and private responses to postexperiment questionnaires, say the investigators, indicated that the influence was internalized as a belief.

Other parts of the study showed, say the researchers, that 1) influence was heightened by a high-status confederate; 2) influence scarcely diminished when a prior subject's (i.e., an absent confederate's) judgments were reported to the subject by the experimenter; and 3) removing paranormal contexts heightened the confederate's impact.

Overall, says Markovsky and Thye, "the results strongly support the claim that paranormal beliefs are transmitted by passive social influence in small groups. . . . A confederate exerts passive social influence on the expressed judgments of subjects, as predicted."

They say that while polls show an overwhelming majority of American belief *some* paranormal claims, most specific beliefs are still minority viewpoints. It is likely, they say, "that most people are cognizant of the marginal status of these claims but hesitant to accept them without social support. Our evidence suggests that such cautiousness results in a degree of resistance to social influence—not a high degree, necessarily but enough to stave off beliefs in claims at the 'wilder' end of the plausibility spectrum, at least until the needed social support is perceived to be in place. . . . Our findings also suggest that paranormal claims endorsed by proximal, legitimate, higher-status others are especially contagious."

—*Kendrick Frazier*

Kendrick Frazier is Editor of the SKEPTICAL INQUIRER.

The carbonaceous Murchison meteorite, pictured here, harbors sugar-related organic compounds.

Sugar in Meteorites Find Lends Support to Space Origin of Life's Building Blocks

A NASA scientist has discovered sugar and several related organic compounds in two meteorites—providing the first evidence that another fundamental building block of life on Earth might have come from outer space.

George Cooper and co-workers from the NASA Ames Research Center found the sugary compounds in two carbon-rich (or "carbonaceous") meteorites, Murchison and Murray. Previously, researchers had found inside meteorites other organic, carbon-based compounds that play major roles in life on Earth, such as amino acids and carboxylic acids, but no sugars.

The new research is reported in a paper, "Carbonaceous Meteorites as a Source of Sugar-related Organic Compounds for the Early Earth," by Cooper et al. published *Nature* (414: 879–883, December 20/27, 2001).

"Finding these compounds greatly

The Fourth International Skeptics Convention

June 20–23, 2002
Burbank, California

CSICOP
THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

The Fourth International Skeptics Convention, sponsored by the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) is to be held at the Hilton, Burbank Airport and Convention Center, Burbank, California, June 20–23, 2002.

The first such conference was held in 1996 at the State University of New York at Buffalo; the second conference, sponsored by CSICOP and the German Society for the Scientific Investigation of Para-Science (GWUP), was held in 1998 at the University of Heidelberg, Germany; and the third, cosponsored with the Australian Skeptics, was held at Sydney University in Sydney, Australia, in 2000.

These conferences have proven to be very successful in bringing together the best known and most effective speakers in the promotion of science, critical thinking and education. Our intent is to bring together the leading lights in the skeptical movement and we are eager to have you be a part of this event. The overall theme is "The Next Twenty-Five Years." We not only want to examine issues that are important today, but also try and focus on topics that will influence science and skepticism in the future. Thus, we are planning sessions on alternative medicine, unsubstantiated psychotherapies, confidence and financial scams, intelligent design and attacks on evolution, education and young skeptics, urban legends, a meeting of local skeptical organizations, and other topics.

Tentative Program:

Alternative Medicine

Wally Sampson
Wim Betz
Stephen Barrett

Bogus Mental Health Therapies

Scott Lilienfeld
Jean Mercer
Gina Green
Steven Jay Lynn
Carol Tavris

Con Games

Robert Steiner
Richard Schroeder
Richard Lead

Educating Our Future

Amanda Chesworth
Diane Swanson
Charles Wynn
Don and Sandra Hockenbury

Intelligent Design

Massimo Pigliucci
William Dembski
Kenneth Miller
Wesley Elsberry

Special Conference Addresses

Marvin Minsky
Harlan Ellison

Look to the Stars

James McGaha
Allen Harris (JPL)
David Morrison

The Investigators

Joe Nickell
Massimo Polidoro
Jan Nienhuys

Other Speakers To Be Announced

Urban Legends

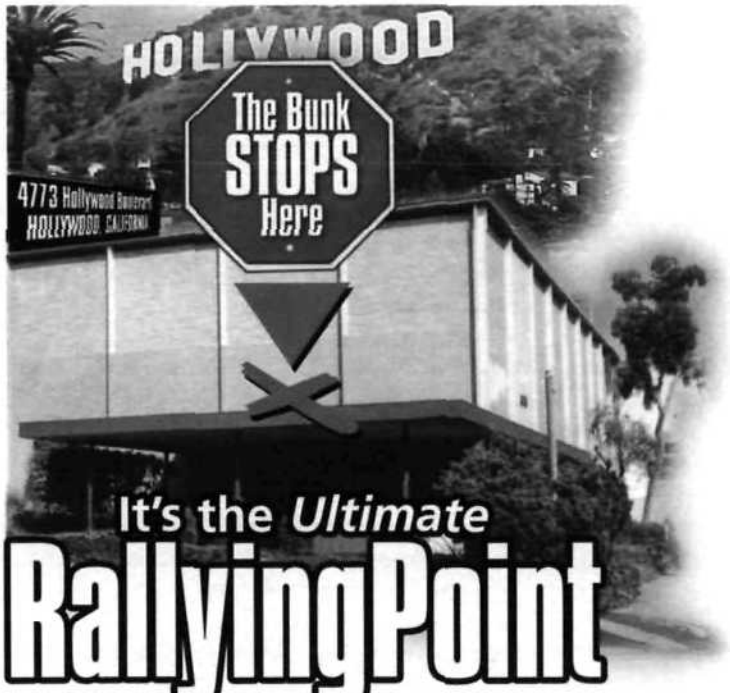
Jan Harold Brunvand
Benjamin Radford
David and Barbara Mikkelson
Tim Tangherlini

Skeptics and the Paranormal in China

Mr. Lin Zixin
Mrs. Shen Zhenyu

For more information contact:

Barry Karr
CSICOP/Skeptical Inquirer
www.csicop.org
PO Box 703
Amherst, NY 14226
(716) 636-1425 ext 217



It's the *Ultimate*

RallyingPoint

Now it depends on you.

THE PROJECT IS LAUNCHED.

No longer a dream, reality has begun for our permanent Center for Inquiry – West. After a five-year search we have purchased a building at 4773 Hollywood Boulevard, in the heart of Hollywood. This *ultimate Rallying Point* for skeptics will house CFI-West's regional programs as well as Center for Inquiry's™ ***new*** *national Media Center.* This development has enormous importance for supporters of critical thinking everywhere, **especially** readers of *Skeptical Inquirer*.

And now it's up to our readers and friends. Only **you** can help us fulfill this bold potential. Purchasing the building took $1.6 million, which we must pay back over three years. Renovation will require another $500,000 – creating a 99-seat auditorium, library, exhibit area, media production center, and offices. We're even looking into solar panels so we can generate our own electricity! An additional $495,000 will equip the Media Center and fund its first three years of operation. Finally we must add millions more to endowment, so the new Center will always be fiscally stable.

All told, we need **$5.85 million,** of which less than $2 million has already been raised. It's the greatest challenge skeptics and secular humanists have faced since our community gave more than $5 million to build and endow the Center for Inquiry – International in Amherst, N.Y., from 1991–1995.

MAJOR GIVING OPPORTUNITIES STILL AVAILABLE!

A major goal demands major gifts. While gifts in any amount are welcome, we urgently need five-, six-, and even seven-figure gifts **now,** early in the campaign, when they can do the most to slash interest costs and spur additional contributions. Fortunately, larger gifts can be made as **pledges** payable over three years. Attractive opportunities exist to name various parts of the new building for oneself or a loved one.

cfi **CENTER FOR INQUIRY**
West and the Center for Inquiry
National Media Center

Regional Headquarters and National Media Center. A joint project of the Center for Inquiry™,
the Committee for the Scientific Investigation of Claims of the Paranormal, and
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adds to our understanding of what organic materials could have been present on Earth before life began," Cooper said. "Sugar chemistry appears to be involved in life as far back as our records go." Recent research using ratios of carbon isotopes have pushed the origin of life on Earth to as far back as 3.8 billion years, he said.

Scientists have long believed meteorites and comets played a role in the origin of life. Raining down on Earth during the heavy bombardment period some 3.8 billion to 4.5 billion years ago, they brought with them the materials that may have been critical for life, such as oxygen, sulfur, hydrogen, and nitrogen. Sugars and the closely related compounds discovered by Cooper, collectively called "polyols," are critical to all known life forms. They act as components of the nucleic acids RNA and DNA, constituents of cell membranes and cellular energy sources.

"This discovery shows that it's highly likely organic synthesis critical to life has gone on throughout the universe," said Kenneth A. Souza, acting director of astrobiology and space research at Ames. "Then, on Earth, since the other critical elements were in place, life could blossom."

The Best and Worst of 2001 Awards

• **The "Valentine Award"** goes to the Kansas State Board of Education, which overturned the creationist-inspired science standards adopted by the previous board in 1999 with more reasonable standards, on February 14, 2001.

• **The "Splendid Use of Plain English Award"** goes to Arthur Caplan, Ph.D., director of the Center for Bioethics at the University of Pennsylvania in Philadelphia, who wrote in an MSNBC Report on February 21 that "The media flubbed the headline for the biggest news event in the past fifty years of science. The reporters and TV talking heads who crammed the Washington, D.C., press conference on February 12 did understand that the details they were hearing about the human genome offered the story of a lifetime. But they missed the real headline.

"Their stories should have simply said, 'Darwin vindicated!'. . . The genome reveals, indisputably and beyond any serious doubt, that Darwin was right—mankind evolved over a long period of time from primitive animal ancestors. Our genes show that scientific creationism cannot be true. The response to all those who thump their bible and say there is no proof, no test, and no evidence in support of evolution is, 'The proof is right here, in our genes.'. . . The theory of evolution is the only way to explain the arrangement of the 30,000 genes and three billion letters that constitute our genetic code. The history of humanity is written in our DNA. Those who dismiss evolution as myth, who insist that evolution has no place in biology textbooks and our children's classrooms, are wrong. The message our genes send is that Charles Darwin was right."

• **The "Gee, So Creationists Stage Fights like Professional Wrestlers? Award"** goes to Kent "Dr. Dino" Hovind, who promotes himself as the "Hulk Hogan" of the creationism debate circuit.

• **The "Now *That's* Credibility Award"** goes to Arkansas State Representative Jim Holt, who sponsored House Bill 2548, an obvious attempt to get creationism back into schools. Holt obtained the testimony of Kent Hovind in hearings on the bill. Many of HB2548's statements about "fraud" in science textbooks can be directly traced to the religious tract "Big Daddy," produced by Jack Chick tracts. That's right—a comic book! As columnist Don Michael of the *Northwest Arkansas Times* wrote on April 5, 2001, "If it isn't troubling to know your legislators voted for a bill that used a comic strip as its source, try visiting Hovind's Web site." The bill was defeated.

• **The "Eugenics Award"** goes to DNA pioneer James Watson, who called for "ridding society of genetic defects" on April 16.

• **The "So, No Slavery Before 1859? Award"** goes to Louisiana State Rep. Sharon Broome, D-Baton Rouge, who sponsored a resolution condemning Charles Darwin's theory of evolution, saying it would "shine a light on the history of racism." The measure was passed by the state's House Education Committee. It later was passed in the Louisiana house, but only after the anti-"Darwinism" statements were removed. Governor Foster called the original measure "weird."

• **The "Told Ya So Award"** goes to NASA for the May 24 press release: "New high-resolution images and 3D altimetry from NASA's Mars Global Surveyor spacecraft reveal the Face on Mars for what it really is: a mesa." NASA also had this to say: "Some people think the Face is bona fide evidence of life on Mars—evidence that NASA would rather hide, say conspiracy theorists. Meanwhile, defenders of the NASA budget wish there was an ancient civilization on Mars."

• **The "Astrology Doesn't Work Award I"** goes to Mangal Raj Joshi, the Nepalese royal astrologer, who admitted that "No one expected it [the massacre of the royal family in a hail of bullets]." Joshi also said "I am not able to explain what happened, but it is terrible. Heavenly planets control the situation on the ground and sometimes we are unable to explain them adequately."

• **The "Astrology Doesn't Work Award II"** goes to the Accrediting Commission of Career Schools and Colleges of Technology (ACCSCT), which granted accreditation to the Astrological Institute in Scottsdale, Arizona (August 30).

• **The "Astrology Doesn't Work Award III"** goes to the www.astroinsight.com Web site, which published its predictions for the

month of September 2001 on August 31, 2001. The seers said "Compared to August the month of September is likely to be relatively a lot less stressful for most of the world, especially from natural and man-made accidents, terrorism, and violence standpoints. Also, after the first week of September, expect some relief to the volatile region of Israel and Palestine. . . ."

• **The "Shucks, Too Bad Award"** goes to medium John Edward, host of *Crossing Over*. Edward had planned to air attempts to communicate with the spirits of victims of the September 11 attacks during November sweeps, but swift and massive negative reactions resulted in cancellation of the idea in less than a day.

• **The "Foot In Mouth Disease Award"** goes to Jerry Falwell, who said the following a few days after the September 11 terror attacks: "I really believe that the pagans, and the abortionists, and the feminists, and the gays and the lesbians who are actively trying to make that an alternative lifestyle, the ACLU, People for the American Way—all of them who have tried to secularize America—I point the finger in their face and say, 'You helped this happen.' . . ." Pat Robertson shares the award for agreeing with Falwell.

• **The "Foot In Mouth Disease Runner Up Award"** goes to Ken Cumming of the Institute for Creation Research, who equated the September 11 terror attacks with the PBS "Evolution" series shown later in September. Cumming said "Both events have much in common. The public was unaware of the deliberate preparation that was schemed over the past few years to lead to these events. And while the public now understands from President Bush that 'We're at War' with religious fanatics around the world, they don't have a clue that America is being attacked from within through its public schools by a militant religious movement called Darwinists."

• **The "Thanks for Supporting the Laws of Thermodynamics Award"** goes to New Mexico Attorney General Patricia Madrid, who slapped "Free Electricity" promoter Dennis Lee with a Temporary Restraining Order at his September 17 stop in Albuquerque during his 2001 nationwide tour. (Lee tours the country every couple of years to promote various "free energy" schemes. These amount to perpetual motion machines which would clearly violate the laws of thermodynamics.) Lee called the restraining order "the most meaningless piece of paper you'll see in your whole life," and said that he wasn't selling investment opportunities—or anything else. He said he would *give* free energy certificates away. But after six hours of non-stop shilling, Lee finally revealed that he only "gives" certificates to people who pay money to sign up with his local dealers.

• Honorable Mentions: Holocaust denier David Irving loses appeal. . . . TV psychic Miss Cleo outfit gets busted . . . God-Man Sai Baba is caught soliciting sex with male devotees. . . .

• **The "Thanks, But We Knew That Award"** goes to Phillip Johnson, who has identified the "Intelligent Designer" at last! Steve Maynard, in the May 7 *Tacoma News Tribune*, wrote "Johnson said he and most others in the intelligent design movement believe the designer is the God of the Bible."

• And NMSR's top 2001 Award—**The Pagan Pride Award**—goes to minister Jack Brock and his Christ Community Church of Alamogordo, New Mexico. The church sponsored a Harry Potter book burning on December 30, 2001. The front page of the *Albuquerque Journal* for December 31 showed the bonfire in the middle of a nice circle of upright stones, called a "henge" in the good old Pagan days. Those old Pagans are proud of you and your flock, Brock! Thanks to Bill Fienning and Kim Johnson for noticing the stone henge independently.

—David E. Thomas

Dave Thomas is a New Mexico physicist and SKEPTICAL INQUIRER *consulting editor. He is also president of New Mexicans for Science and Reason, for which this was originally prepared.*

Recent Deaths

Some recent deaths we have been meaning to note:

Fred Hoyle, distinguished and creative (if iconoclastic) astrophysicist, respected scientifically for contributions to the theory of the structure of stars and origin of chemical elements in stars, famous (some might say notorious) for always seeing (and often taking) the unorthodox side of scientific arguments, originator (mockingly) of the term "Big Bang" for the theory that prevailed counter to his steady-state view of the universe, proponent of the panspermia hypothesis that life could form between the stars and may have seeded Earth, and writer of noteworthy science fiction (*A for Andromeda, The Black Cloud*, etc.), on August 26, 2001, at the age of 86.

Poul Anderson, science fiction writer, one of the last from SF's golden age, winner of three Nebula and seven Hugo awards (and, for *Genesis*, the John W. Campbell Award for best science fiction novel of 2000), imaginative and prolific writer, clear thinker, and skeptic (he contributed occasional letters to SI), on July 31, 2001, in Orinda, California.

Derek Freeman, Australian anthropology professor and expert on Samoa who in books and articles over the past two decades vociferously disputed the validity of much of Margaret Mead's field work and observations about adolescence in Samoa and in what became a fierce anthropological controversy battled with U.S. anthropologists and social scientists who came to Mead's defense, including notable exchanges in the SKEPTICAL INQUIRER (November/December 1998, May/June 1999, November/December 2000), on July 6, 2001, in Canberra, at the age of 84.

Charles Johnson, irrepressible advocate of a flat Earth and president of the International Flat Earth Society for nearly three decades, on March 19, 2001, at the age of 76.

—Kendrick Frazier □

Science and Religion: The Conference

BENJAMIN RADFORD

The first conference of the Center for Inquiry International sponsored by the Committee for the Scientific Investigation of Claims of the Paranormal (publisher of the SKEPTICAL INQUIRER) and the Council for Secular Humanism (publisher of *Free Inquiry*) was held in Atlanta, Georgia, November 8–11, 2001. Titled, "Science and Religion: Are They Compatible?" the conference addressed a variety of issues regarding science and religion, including the efficacy of medical prayer, near-death experiences, intelligent design, and evolutionary biology and religious belief. About 500 people attended—packing the ballrooms during most symposia and taking part in lively question-and-answer sessions—making the conference one of the most successful in years. The then-recent terrorism kept only a handful of people away.

Philosopher Paul Kurtz, founder and chairman of both CSICOP and CSH, introduced the conference. (The full text of his remarks appear as an article in this issue.)

There was a subtle but distinct reduction in the overall testosterone present in the sessions and hallways compared to many previous CSICOP events, and older white males were conspicuous but did not dominate the conference. Many women (and more than a few minorities and nationalities) were to be seen in the halls and at the sessions. Whether this reflects the topic's broad gender appeal or the previously separate humanist mix is unclear, but the change was a welcome one regardless.

One reason we keep the idea of the soul around is that we as a culture are afraid of what we will lose if we abandon it.

Also refreshingly welcome were the "opposition" speakers (primarily near-death researcher Raymond Moody, psychic researcher Gary Schwartz, and theistic astronomer Owen Gingerich). They were treated fairly and respectfully and were given equal time with the skeptical speakers. Perhaps expecting a dogmatic or hostile audience, both in fact expressed appreciation at the respect they received and the fair hearing they got. They were at times called on comments they made (astrophysicist and CSICOP Fellow Neil de Grasse Tyson took Schwartz to task for bad and misapplied physical science), but the discussions were cordial.

Other invited non-skeptical speakers declined to participate or were unable to attend (such as *Healing Words* author Larry Dossey and intelligent design proponents Michael Behe and William Dembski). During his talk, Tampa Bay Skeptics leader and healing prayer panelist Gary Posner occasionally and good-naturedly addressed the empty chairs where his opponents were to have been.

Nobel laureate Wole Soyinka (he received the 1986 Nobel Prize in literature) addressed a lunch banquet, discussing the role of religion in the modern world and the syncretization of traditional gods with modern ones in his native Nigeria. In a rich, deep, lightly accented voice he described how traditional deities have been incorporated into modern Nigerian life (including a power plant named after a god of power, who, given the erratic and "epileptic" nature of the power flow, would likely be embarrassed by the association).

William Casebeer, assistant professor of philosophy at the U.S. Air Force Academy, spoke on the idea and nature of souls, displaying not only philosophical expertise but also a broad range of diction (using phrases ranging from *dispositionally reductive* to *funky*). "What do we mean by *souls*?" he asked. He argued that one reason we keep the idea of the soul

Benjamin Radford is Managing Editor of the SKEPTICAL INQUIRER.

around is that we as a culture are afraid of what we will lose if we abandon it. People must realize, he said, that "valued norms will not disappear if we eliminate the traditional concept of the soul."

The near-death experience session was somewhat informative but ultimately unsatisfying. The speakers began well enough, with Royal College of Psychiatrists member Karl Jansen discussing how pharmaceutically induced hallucinations are remarkably similar to many reported near-death experiences (NDE). The drug he spoke of, ketamine, reportedly can induce all the typical NDE characteristics, including a sense of leaving the body, having profound and hyperreal experiences, and so on.

I was interested to hear more, to get Dr. Raymond Moody's answer as to whether or not he would admit that NDEs could be artificially induced. Instead, Moody, a soft-spoken and genial type, discussed his belief that NDEs do not make sense and that there is intelligibility in nonsense. As support he gave lines from Lewis Carroll's "Jabberwocky" poem, saying that although made of nonsense words, one could derive meaning and pattern from them. Judging by the questions that followed, many in the audience didn't feel that the presentation helped them understand either NDEs or Moody's position on them.

Perhaps the most informative (and germane) discussion was on the topic of intelligent design. Hector Avalos, Eugenie C. Scott, Massimo Pigliucci, and Matthew Young were panelists, and each gave excellent and informative presentations. Pigliucci and Young in particular gave understandable explanations of natural selection and how one might read intelligent design into perfectly natural evolutionary processes. The ordering of sand and shells on a beach, noted Pigliucci, is a good example of design by natural means. The orderly arrangement from fine sand particles on up to large stones is the result of natural processes (wave action, gravity, etc.) yet might be considered designed, or at least "ordered." During the discussion, the panelists debated among themselves, providing an informative glimpse into the thoughts and positions of intelligent experts with genuine differences of opinion.

Gary Posner, left, and Hector Avalos answer questions on medical prayer.

SKEPTICAL INQUIRER editor Ken Frazier receives the "In Praise of Reason" award from Paul Kurtz.

David Willey (on the bed of nails) about to have a cinder block broken over his chest by Ben Radford.

At the awards banquet, SKEPTICAL INQUIRER editor Ken Frazier was presented with CSICOP's highest honor, the "In Praise of Reason" Award in recognition of his long and invaluable work on this magazine. The award is given for "distinguished contributions to the use of critical inquiry, scientific evidence, and reason in evaluating claims to knowledge." Previous recipients include Carl Sagan, Richard Dawkins, Martin Gardner, and Leon Lederman.

Just before a standing ovation, Frazier spoke of his feelings about receiving the award: "I am more a toiler in the editorial fields than an inhabitant of the lofty spires of academia, so that makes me all the more appreciative." He noted that "We are far from perfect and we have occasionally made mistakes, but I think CSICOP and the many scientists, psychologists, scholars, writers, and investigators worldwide who make up the movement have done, all in all, a remarkable job of defending science and scientific inquiry....They have helped educate the public and the media about what good science is all about." (See his Commentary in this issue, page 62.)

Physicist and *Tonight Show with Jay Leno* "Resident Mad Scientist" David Willey provided entertainment for the banquet awards crowd. Willey performed some amazing science demonstrations (some with fire and small explosions) as nervous Marriott employees looked on. After the event, some staff grumbling was heard about small chunks of dry ice and concrete on the ballroom carpet, but no altercations were reported.

Though the conference raised as many questions as it answered, attendees came away with a better appreciation of the issues and players in the ongoing dialogue between science and religion. □

Bioterrorism and the NCCAM

The Selling of 'Complementary and Alternative Medicine'

The recent bioterrorism threat has attracted renewed attention to the myriad pseudoscientific claims that permeate "complementary and alternative medicine." Past history predicts that there will be continued pressure for the National Center for Complementary and Alternative Medicine (NCCAM) to fund studies of claims that can already be dismissed on the basis of established knowledge.

KIMBALL C. ATWOOD IV, M.D.

Thanks to the threat of bioterrorism, Dr. Stephen E. Straus, director of the National Center for Complementary and Alternative Medicine (NCCAM), may be on the verge of shedding his naïveté about the real purpose of the organization that he runs. At a hearing of the House Government Reform Committee on November 10, 2001, Dr. Straus warned against the use of "alternative" remedies for the prevention or treatment of anthrax or other diseases of bioterrorism. He pointed out that there is no evidence supporting the use of such remedies, and that they may interfere with the effectiveness of proven measures (Associated Press 2001). Dr. Straus is a virologist, and his statements were consistent with the views of any reasonable, scientifically trained physician.

What Dr. Straus may not have appreciated is that the chairman of the committee to which he addressed his remarks is not pleased by rational evaluations of "alternative medicine." Republican Dan Burton battled to legalize the dangerous quack cancer "cure" laetrile in his home state of Indiana in the 1970s. He is called "quackery's best friend in Congress" by Stephen Barrett, M.D., the creator of the award-winning Quackwatch Web site and the vice-president of the National Council Against Health Fraud (NCAHF). Although laetrile remained outlawed in the U.S., Rep. Burton has continued to support other dangerous and absurd cancer treatments, such as the "anti-neoplastons" of Stanislaw Burzynski and the regimen of coffee enemas, hundreds of daily "dietary supplement" pills, and hair analyses of Nicholas Gonzalez. Burton also supports passage of the Access to Medical Treatment Act, an annually defeated bill that would permit quacks to prey upon unsuspecting consumers without having to worry about legal interference. Most recently Rep. Burton showed how rabid his intentions are by falsely accusing another NCAHF board member, Dr. Tim Gorski, of having misrepresented his credentials following Dr. Gorski's incisive testimony at the Senate Hearing on Anti-Aging Quackery on September 10. The details of that event are available at the Quackwatch Web site (Barrett 2001a; Burton 2001; Gorski 2001).

Rep. Burton was disturbed, at the bioterrorism hearing, to learn that neither the NCCAM nor the FDA is testing "alternative" remedies for anthrax and smallpox. According to the AP report quoted on CNN.com, Rep. Burton opined that since there are only 15 million doses of smallpox vaccine available, the government should be pursuing "alternative" remedies. "We're facing a terrorism threat now," he said.

Rep. Burton suggested that the lack of government interest in "alternative" proposals might be due to a conspiracy between the FDA and the pharmaceutical industry. Queried Burton, "unless it's brought to you by a pharmaceutical company, you don't take action?" A representative of the FDA replied that anyone may apply for drug approval, but that no applications for "alternative" substances had been made. Dr. Straus, for his part, said that he would be "open" to funding research on "natural remedies" for the agents of bioterrorism. He would be wise to do just that if he hopes to keep his job; but should he?

The OAM Legacy

Straus began his tenure as the sixth (but only third full-time) director of the NCCAM two years ago, when the name of the organization had just changed from the "Office of Alternative Medicine." The OAM had been established in 1991 not because of any scientific or medical need, but because of the sectarian leanings of Iowa Senator Tom Harkin, who was convinced that his hay fever had been cured by bee pollen. The first full-time director was Joseph

Dr. Atwood is an anesthesiologist at the Newton-Wellesley Hospital in Newton, Massachusetts, and Clinical Assistant Professor at Tufts University School of Medicine. He is a Contributing Editor of the Scientific Review of Alternative Medicine, *and represented the Massachusetts Medical Society at the Massachusetts Special Commission on Complementary and Alternative Medical Practitioners from October 2000 to January 2002.*

Jacobs, M.D., like Straus a nonideologue with an ingenuous enthusiasm for "alternative medicine." Jacobs's tenure was short precisely for that reason. As reported in *Science* magazine in 1994, Senator Harkin drummed Jacobs out of the office after only a year, once it became clear that Jacobs felt that the role of the OAM was to subject aberrant methods to rational scrutiny (Marshall 1994). Harkin would apparently have preferred that these methods simply be declared valid and integrated into common practice. In an article in *The New Republic* in 1996, Dr. Jacobs was quoted as saying, "it's pathetic. They were so naïve about science. I wouldn't trust anything coming out of the OAM as long as the Harkinites are micromanaging it" (Satel and Taranto 1996).

The next full-time director of the OAM was Wayne Jonas, M.D., a believer in homeopathy, an absurd eighteenth century "healing system" that has been known to be at odds with the fundamentals of chemistry and biology since shortly after its introduction. Homeopaths maintain that "like cures like" (hence the name): thus the "cure" for a disease is a substance that produces similar symptoms when given to a healthy person. An example is the use of onion for the common cold. Medical historians, anthropologists, and psychologists recognize this as a variation of the "doctrine of signatures," a prescientific myth common to the folklore of many cultures. Homeopathy doesn't leave it at that, however. The curative agent must be "potentized" by a series of dilutions and "succussions," such that not even a molecule of the original substance remains in the "remedy." Thus the patient is given a sugar pill, or possibly a small quantity of water or alcohol.

Homeopathy offers the very sort of "alternative remedy" that Rep. Burton might imagine could solve the bioterrorism problem. Zealous homeopath Dana Ullman, quoted in a recent article for *Utne Reader* Online, recommends homeopathic "nosodes" to prevent anthrax (Garsombke 2001). These consist of farm animals infected with anthrax, ground up, and diluted in alcohol to well beyond the point at which any trace of the original preparation remains. According to the article this works like a vaccine and is utterly safe. Nevertheless, Ullman recommends that its use be limited to high-risk persons such as postal workers.

Ullman is well known and respected in CAM circles. According to the Web site Integrative Medicine: the Worldwide Authority on Integrative Care, "Mr. Ullman is a member of the advisory council of the Alternative Medicine Center at Columbia University's College of Physicians and Surgeons [and] a former consultant to the World Health Organization" (*Integrative Medicine* 2001). A visit to the Web site of Columbia's Rosenthal Center for Complementary and Alternative Medicine confirms that Ullman's Web site, Homeopathic Educational Services, is recommended, as is another link in which "[d]ozens of full-text articles and excerpts from books by Dana Ullman are available" (Rosenthal Center 2001). Such is the topsy-turvy world of pseudomedicine and its startling patrons.

NCCAM and Advisors

Dr. Straus can assume that there will be pressure for the NCCAM to investigate Ullman's ridiculous claim. In addition to the advocacy of legislators such as Harkin and Burton and the legacy of Dr. Jonas, there are several influential NCCAM advisors who can be expected to agree with Ullman. On the National Advisory Council, for example, are three "naturopathic doctors." Naturopathy is an eclectic assortment of implausible "alternative" claims, one of which is homeopathy. Homeopathy is taught, uncritically, in all four naturopathic schools. Ullman's Web site is listed as a "recommended Web site" by the National College of Naturopathic Medicine in Portland, Oregon (NCNM 2001). Homeopathy is promoted in the *Textbook of Natural Medicine* (Pizzorno and Murray 1999), the only general textbook of the field of naturopathy, and is recommended in virtually every naturopathic treatise. The 1994 edition of the *Journal of Naturopathic Medicine* (the "official publication of the American Association of Naturopathic Physicians"), as reviewed by Stephen Barrett, promotes homeopathic "nosodes" as safer and more effective than real vaccines (Barrett 2001b). Many naturopaths consider themselves to be "specialists" in homeopathy.

These naturopaths are by no means the only advocates for homeopathy who have the ear of Dr. Straus. On the NCCAM Cancer Advisory Panel is Ralph Moss, whose *Cancer Chronicles* newsletter has suggested that homeopathy and many other unlikely treatments can cure cancer (Moss 1995). Across town the White House Commission on Complementary and Alternative Medicine Policy (WHCCAMP) includes Pizzorno (the co-editor of the naturopathy textbook), Dr. Jonas, and a host of other magical thinkers headed by the chairman, psychiatrist James Gordon. Dr. Gordon is best known for his belief in alien abductions and his contention that schizophrenia is a rational response to an irrational world (Gorski and Curry 2001).[1] The rosters of all of these panels have been examined by Dr. Gorski and consumer health activist E. Patrick Curry, who found few critical thinkers among the lot. Their findings are available for public review at the Quackwatch Web site as part of Gorski's rebuttal to Rep. Burton's misrepresentation charges (Gorski 2001).

Is Dedicated CAM Research Justified?

Straus revealed his naïveté regarding the truth of the NCCAM shortly after his tenure began. It was the case then, and still is, that not a single Complementary and Alternative Medicine (CAM) claim had been shown to be either useful or useless by studies sponsored by the OAM/NCCAM. Unbowed in an article for *Academic Medicine*, Straus parroted several common misconceptions about CAM: inflated

figures of public demand; the confusion of popularity with validity; the notion that many CAM claims have already been proven "safe and effective," so that it's necessary to "overcome the reluctance of conventional physicians to consider" them; that long-used botanical products, ignored by the pharmaceutical industry, are likely to yield powerful new therapies; that some accepted modern treatments that were "once regarded as radical," such as radiation therapy, are analogous to methods such as acupuncture; that time constraints on the "privileged physician-patient relationship" caused by managed care somehow justify the promotion of implausible and unproven methods; that "a more patient-centered and less paternalistic approach should be stressed," again somehow justifying CAM;[2] and more (Strauss 2000).

Dr. Straus also demonstrated his innocence of the realities of CAM by his glowing review of a speech by Andrew Weil, whose irrational views of medicine and science are well documented (Relman 1998). Straus wrote, "few would argue against the wisdom" of Weil's call to "train young physicians about CAM," apparently failing to appreciate that Weil would have this training performed by advocates, not skeptics. Even now, the vast majority of medical school CAM courses are not critical of the implausible claims that they teach (Sampson 2001a).

Notably absent from Straus's essay was a theme absent from almost all expositions favoring CAM research: considerations of "prior probability." That is, most CAM methods are at odds with established science (also known as *facts:* homeopathy is a perfect example), such that no experimental data can validate them. There is no point in studying such methods, since the results will either be negative (if all studies are rigorous) or equivocal (if some studies are sloppy or fraudulent). Either of these outcomes is consistent with "zero" prior probability, but the latter outcome leads many well-intentioned investigators, including Straus, to the erroneous conclusion that "further studies are needed." This is the current status of research into homeopathy and many other CAM claims, and it can therefore be predicted that the silliness will persist indefinitely. The NCCAM, for example, currently funds whimsical homeopathic "research" by former director Jonas.[3]

Wallace Sampson, M.D., the editor of the *Scientific Review of Alternative Medicine*, answered all of Dr. Straus's points in a letter to *Academic Medicine* (Sampson 2001b), but Straus's subsequent reply revealed that he had failed to understand Sampson's arguments (Straus 2001). Indeed, Straus betrayed another misconception about CAM when he suggested that if research shows a method to be useless, demand for it will be reduced markedly; thus, presumably, even skeptics should favor CAM research. This is naïve, because advocates are not dissuaded by science. A short list of CAM claims that have already been convincingly shown to be worthless, both as a matter of established knowledge and as a matter of studies performed, includes: iridology, applied kinesiology, craniosacral therapy, homeopathy, the chiropractic subluxation theory, vitamin C for prevention of the common cold, echinacea for same, guided imagery, hair analysis for most purposes, magnets for arthritis pain, reflexology, "distant healing," Therapeutic Touch, chelation therapy for atherosclerosis, and acupuncture for all but one or two specific indications. All of these methods are alive and thriving, and by funding research into several of them the NCCAM is contributing to their perpetuation.

Straus offered laetrile as an example of a treatment whose public demand "abated markedly only after competent studies showed it to be ineffective." There is no evidence that this is true. Laetrile is still offered in clinics just across the border in Mexico, and was available via the Internet as recently as a year ago, when the FDA shut down the vendor (Lewis 2001). The aforementioned Ralph Moss, a member of Straus's Cancer Advisory Panel, was still advocating laetrile as an effective treatment for cancer during the 1990s and accused the Mayo Clinic, because of its competent 1982 study that showed laetrile to be ineffective (Moertel et al. 1982), of being "fraudulent" (Moss 1993). The OAM itself can reasonably be viewed, at least in part, as a legacy of the paranoid, far-right laetrile movement of the 1970s. This was led by the Committee for Freedom of Choice in Cancer Therapy (now known as the Committee for Freedom of Choice in Medicine), every one of whose founding members was also a member of the John Birch Society (Wilson 2000).[4] The NCCAM, due to pressure from ideologues such as Moss and Burton (Stokstad 2000), is even now funding studies of Kelly-Gonzalez therapy, an absurd cancer treatment whose history closely parallels that of laetrile itself (Wilson 2000; Barrett and Herbert 2001; Green 1998). Is it possible that Straus is unaware of these associations?

The Selling of CAM

It seems clear that the real purpose of the NCCAM is a political one: to promote "complementary and alternative" methods despite a lack of credibility or, at the very least, prior to substantial scientific validation. WHCCAMP Chairman (and former NCCAM adviser) James Gordon recently admitted as much in a remarkably frank statement for *The Scientist:* "The reason there is as much interest in complementary medicine as there is, is not because of the science. The moving force has been us" (Bunk 2001). In the same article Gordon proclaimed his impatience for legitimate biomedical investigations:

> [Gordon] argues that the reductive study of isolated therapies is too slow and is irrelevant because CAM treatments are administered in combination. Research must be conducted on integrated approaches, as well as on treatments that are individualized, such as Chinese herbs prepared for a particular patient's needs. "This is crucial," he insists. "This may represent one of the most profound

> shifts. . . . We're talking about a fundamental sea change in the way we look at medicine and health care." (Bunk 2001)

Never mind that plenty of rational, evidence-based therapies are "administered in combination," and virtually all are "individualized for a particular patient's needs." This "sea change," an example of the "special pleading" fallacy, is nothing more or less than the selling of CAM.

The annual budget of the OAM/NCCAM has grown from $2 million at its inception to $90 million in 2001. This may be a small fraction of the total NIH budget of over $10 billion, but it certainly begs the question of how such funds might be better spent. One thinks of providing protease inhibitors to poor AIDS victims, or feeding starving Afghanis. Or, perhaps, expanding the pool of vaccines for anthrax and smallpox.

Notes

1. Ironically, Dr. Gordon was also once a follower of the violent Indian guru Bhagwan Shree Rajneesh, whose cult attempted to take control of the town of Antelope, Oregon in 1984. In an act of bioterrorism, cult members placed salmonella in salad bars of area restaurants, causing at least 750 people to become ill (Gorski 2001; Torok et al. 1997).

2. Here is an example of "patient-centered" care according to Konrad Kail, one of the naturopaths on the National Advisory Council for Complementary and Alternative Medicine: "'If I *see a patient who has pain in his arms because his* neck is out of alignment,' Dr. Kail says, 'I explain to them that we can do spinal adjustments, acupuncture, homeopathy, or we can do all three. Then I wait for their choice.'" Quoted in Morton, M., and M. Morton. Naturopathic Medicine. Healthworld Online. Accessed 11/01 at: www.healthy.net/asp/templates/article.asp?PageType=Article&ID=508.

3. Among the other boondoggles that the NCCAM funds are a study of "meridians"; acupuncture for shortness of breath in cancer patients; acupuncture for hypertension; acupuncture for HIV positive drug abusers; acupuncture and "moxa" for chronic diarrhea in HIV patients; "healing (non) touch" for neonates; osteopathic manipulation for chronic obstructive pulmonary disease; several studies that assume the validity of the "subluxation" theory; and several "distant (psychic) healing" studies (see: http://nccam.nih.gov/research/grants/rfb/fy01.htm). One of the grant recipients for "distant healing" is a naturopath who is also a member of the NCCAM advisory council. Another is Elisabeth Targ, about whom Martin Gardner has recently written in SI (March/April 2001). There are also multiple grants for the establishment and maintenance of CAM training programs and "integrative medicine centers," which would seem to be putting the cart before the horse.

4. CAM advocacy may once have been a largely right-wing phenomenon, but no more. If Columbia University and homeopaths make strange bedfellows, so do ex-hippies (e.g., Gordon and Weil) and ex-Birchers. The traditional anti-intellectualism of the right has recently been joined by a similar sentiment from the left. This has been no less true in medicine (Sampson 1998) than in the academy (see, for example, Gross and Levitt 1994).

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'Mothman' Solved!

JOE NICKELL

A 2002 movie, *The Mothman Prophecies*, tells the story of a reporter (played by Richard Gere) who is drawn to a West Virginia town by eyewitness accounts of a flying monster. From November 1966 to November 1967, residents in the vicinity of Point Pleasant (near the Ohio state line) were frightened by "Mothman" (whose appellation was a reporter's takeoff on the then-current *Batman* TV series). The movie is based on a book of the same title by arch paranormal mystery monger John A. Keel (1975). Keel rounded up giant bird reports, both local and worldwide, and combined them with UFO sightings, visits by Men in Black, telephone predictions from alleged extraterrestrials and their "contactees" (precursors of the "abductees"), plus a tragic bridge collapse and sundry other elements.

"Mothman" was encountered one night about seven miles from town when two couples drove through an abandoned complex popularly called the TNT area (after its World War II use for making munitions). About 11:30 P.M. they saw the glowing red eyes of a creature, "shaped like a man, but bigger," one witness would say. "And it had big wings folded against its back." It was further described as greyish and walking on sturdy legs with a shuffling gait. As it took flight and seemed to follow them, it "wasn't even flapping its wings" but "squeaked like a big mouse" (quoted in Keel 1975, 52–53).

Soon others were seeing the winged enigma, including two Point Pleasant firemen who visited the TNT area just three nights after the couple's sighting. They too saw the red eyes and described the creature as "huge" but were emphatic: "It was definitely a bird" (Keel 1975, 56). Most reports described it as headless yet with large, shining red eyes set near the top of its body. Not all accounts agreed, however: One woman stated that what she saw "had a funny little face" although she "didn't see any beak," just those "big red poppy eyes." Keel also describes some "gigantic birds" about seventy miles to the north, in Ohio, that had a ten-foot wingspan and heads with "a reddish cast," yet lacking "the famous glowing red eyes" (Keel 1975, 60–61).

Allowing for an exaggeration of size—perhaps caused by an overestimate of the intervening distance—the Ohio birds seem to fit the appearance of the common turkey vulture which can have a six-foot wingspan and an unfeathered red head (*Audubon* 1977).

But what about the red-eyed "Mothman" sightings? The creature at the old munitions area "had two big eyes like automobile reflectors," and others echoed that description, including one man who, alerted by his dog in the direction of his hay barn, spotted it with a flashlight (Keel 1975, 49, 52). Revealingly, according to Frank B. Gill's *Ornithology* (1994), "At night some birds' eyes shine bright red in the beam of a flashlight or automobile headlights. This 'eyeshine' is not the iris color but that of the vascular membrane—the tapetum—showing through the translucent pigment layer on the surface of the retina."

At this point it seems relevant to

Joe Nickell is CSICOP's Senior Research Fellow and author of numerous investigative books.

consider a real West Virginia winged creature—one that has "nocturnal habits" and "large, staring eyes" of the type that yield crimson eyeshine, plus "facial discs" that can make the eyes appear even larger. It has a large head and (unbirdlike) is "monkey-faced," but looks "quite neckless" (its very short neck sloping into its body so it could seem headless in silhouette). It has "oversized wings and long legs," the latter being "powerful" and (unlike the spindly legs of many birds) covered with feathers, making them look relatively thick. Its flight is "noiseless" and indeed "mothlike," although during flight it may vocalize a "loud, trailing 'khree-i.'" Its broad range includes West Virginia, and it is a "widespread nester in human habitations"; in fact it "hides in old buildings" (like those of the TNT complex), as well as barns, etc. Because it is active only at night, it is "seldom disturbed or even seen by humans," so when it is encountered it has an unfamiliar as well as "sinister appearance" (Bent 1961; Cerny 1975; Coe 1994; Peterson 1957, 1980; Steward 1977).

Its name is *Tyto alba*, the common barn owl. While it is far from man-sized, due to its big wings (some forty-four inches) and long legs it nevertheless "appears deceptively large, especially in flight" ("barn" 2001; Coe 1994). Allowing for such deception—compounded by multiple unknowns (distance, true size, size of nearby objects for comparison), as well as darkness, surprise, fear, and other magnification factors—we have what I believe is the most likely candidate for "Mothman." (Of course, given the many reports, there is unlikely to be a single explanation for all, and hoaxes, hallucinations, other birds, etc., may have been involved in the contagion.)

We are thus faced with a choice between a plausible, naturalistic explanation on the one hand, and a fanciful, incredible one on the other, the evidence for which is based solely on the most undependable evidence: reports by excited eyewitnesses. I think we must choose the former, while realizing that the latter will be preferred by Hollywood producers and others bent on selling a mystery.

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INVESTIGATIVE FILES

JOE NICKELL

Undercover Among the Spirits: Investigating Camp Chesterfield

Camp Chesterfield is a notorious spiritualist enclave of Chesterfield, Indiana. Dubbed "the Coney Island of spiritualism," it has been the target of many exposés, notably a book by a confessed fraudulent medium published in 1976. A quarter century later I decided to see if the old deceptions were still being practiced at the camp; naturally my visit was both unannounced and undercover.

The Background

Modern spiritualism began in 1848 with the schoolgirl pranks of Maggie and Katie Fox at Hydesville, New York. Although four decades later the sisters confessed that their "spirit" rappings had been bogus, in the meantime the craze of allegedly communicating with the dead had spread across America, Europe, and beyond. At séances held in darkened rooms and theaters, "mediums" (those who supposedly contacted spirits for others) produced such phenomena as slate writing, table tipping, and "materializations" of spirit entities.

As adherents grew in number, spiritualist camp meetings began to be common, and some groups established permanent spiritualist centers.

Perhaps none developed such an unsavory reputation as Camp Chesterfield, which opened in 1891. Even today, spiritualist friends of mine roll their eyes accusatorially whenever Chesterfield's name is mentioned, and they are quick to point out that the camp is not chartered by the National Spiritualist Association of Churches. The introduction to an official history of Chesterfield (*Chesterfield Lives* 1986, 6), admits it is surprising the camp has survived, given its troubled past:

> In fact, in its 100 years of recorded history, Camp Chesterfield has been "killed off" more than once! There have been cries of "fraud" and "fake" (and these were some of the nicer things we have been called!) and of course, the "exposés" came along with the regularity of a well-planned schedule. Oh yes! We have been damned and downed—but the fact remains that we must have been doing something right because: CHESTERFIELD LIVES!!

Be that as it may, the part about the exposés is certainly true.

A major exposé came in 1960 when two researchers—both sympathetic to spiritualism—arranged to film the supposed materialization of spirits. This was to occur under the mediumship of Edith Stillwell, who was noted for her multiple-figure spirit manifestations, and the séance was to be documented using see-in-the-dark technology. While the camera ran, luminous spectral figures took form and vanished near the medium's cabinet, but when the infrared film was processed the researchers saw that the ghosts were actually confederates dressed in luminous gauze, some of whom were recognizable as Chesterfield residents. They had not materialized and dematerialized but rather came and went through a secret door that led to an adjacent apartment (Keene 1976, 40; Christopher 1970, 174). One of the researchers, himself a devout spiritualist, was devastated by the evidence and railed against "the frauds, fakes and fantasies of the Chesterfield Spiritualist camp!" (O'Neill 1960)

An even more devastating exposé came in 1976 with the book *The Psychic Mafia* written by former Chesterfield medium M. Lamar Keene. Saying that money was "the name of the game" at Chesterfield, Keene detailed the many tricks used by mediums there which he dubbed "the Coney Island of Spiritualism." He told how "apports" (said to be materialized gifts from spirits) were purchased and hidden in readiness for the séance; how chiffon became "ectoplasm" (an imagined mediumistic substance); how sitters' questions written on slips of paper called billets were secretly read and then answered; how trumpets were made to float in the air with discarnate voices speaking through them; and how other tricks were accomplished to bilk credulous sitters (Keene 1976, 95–114).

Keene also told how the billets were shrewdly retained from the various

Joe Nickell is CSICOP's Senior Research Fellow; his latest book is Real-Life X-Files (2001).

public clairvoyant message services held at Chesterfield. Kept in voluminous files beneath the Cathedral, the billets—along with a medium's own private files and those shared by fellow scam artists—provided excellent resources for future readings.

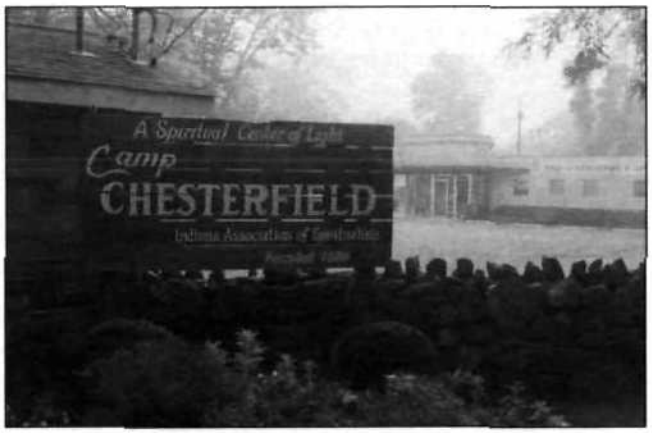
There were other exposés of Camp Chesterfield. In 1985 a medium from there was making visits to Lexington, Kentucky, where he conducted dark-room materialization séances. He featured the production of apports, the floating-trumpet-with-spirit-voices feat, and something called "spirit precipitations on silk." To produce the latter, the sitters' "spirit guides" supposedly took ink from an open bottle and created their own small self-portraits on swatches of cloth the sitters held in their laps. I investigated when one sitter complained, suspecting fraud. Laboratory analyses by forensic analyst John F. Fischer revealed the presence of solvent stains (shown under argon laser light). A recipe for such productions given by Keene (1976, 110–111)—utilizing a solvent to transfer pictures from newspapers or magazines—enabled me to create similar "precipitations" (Nickell with Fischer 1988). The prepared swatches had obviously been switched for the blank ones originally shown.

Undercover

I had long wanted to visit Camp Chesterfield, and in the summer of 2001, following a trip to Kentucky to see my elderly mother and other family members, I decided to head north to Indiana to check out the notorious site.

Now, skeptics have never been welcome at Chesterfield. The late Mable Riffle, a medium who ran the camp from 1909 until her death in 1961 (*Chesterfield Lives* 1986) dealt with them summarily. When she heard one couple using the f-word—*fraud*—she snarled, reports Keene (1976, 48), "We do not have that kind of talk here. Now you get your goddam ass off these hallowed grounds and don't ever come back!"

Another skeptic, a reporter named Rosie who had written a series of exposés and was banned from the grounds, had the nerve to return. Wearing a "fright wig," she got into one of Riffle's séances and when the "spirits" began talking



through the trumpet the reporter began to demean them. According to Keene (1976, 48–49), Riffle recognized Rosie's voice immediately and went for her. "Grabbing the reporter by the back of the neck, she ushered her up a steep flight of stairs, kicking her in the rump on each step and cursing her with every profanity imaginable."

With these lessons in mind, I naturally did not want to be recognized at Chesterfield—not out of fear for my personal safety but so as to be able to observe unimpeded for as long as possible. When in my younger years I was a private investigator with an international detective agency, I generally used my own name and appearance and, for undercover jobs, I merely wore the attire that was appropriate for a forklift driver, steelworker, tavern waiter, or other "role" (Nickell 2001).

The same is true for several previous undercover visits to paranormal sites and gatherings (including a private spiritualistic circle which included table-tipping and other séances that I infiltrated in 2000). Since I am often the token skeptic on television talk shows and documentaries on the paranormal, I have naturally feared I might be recognized, but I rarely made any effort to disguise myself and usually had no problem.

However, for my stint at Camp Chesterfield, I felt special measures were called for so I decided to alter my appearance, shaving off my mustache (for the first time in over thirty years!), and replacing my coat-and-tie look with a T-shirt, suspenders, straw hat, and cane. I also adopted a pseudonym, "James Collins," after the name of one of Houdini's assistants. From July 19 to 23, "Jim," who seemed bereft at what he said was the recent death of his mother, limped up and down the grounds and spent nights at one of the camp's two hotels (devoid of such amenities as TV and air conditioning). The results were eye-opening, involving a panoply of discredited spiritualist practices that seemed little changed from when they were revealed in *The Psychic Mafia*.

Billet Reading

I witnessed three versions of the old billet scam: one done across the table from me during a private reading, and two performed for church audiences, one of them accomplished with the medium blindfolded.

The first situation—with the medium working one-on-one with the client—involves getting a peek at the folded slip while the person is distracted. (Magicians call this *misdirection*.) For instance, while the medium directs the sitter's attention, say by pointing to some numerological scribblings (as were offered in my case), she can surreptitiously open the billet in her lap with a flick of the thumb of her other hand and quickly glimpse the contents. As expected, the alleged clairvoyant knew exactly what was penned on my slip—the names of four persons who had "passed into spirit" and two questions—but did not know that the people were fictitious.

One aspect of the reading, which was held in the séance room of her cottage, was particularly amusing. At times she would turn to her right—as if acknowledging the presence of an invisible entity—and say "Yes I will." This was a seeming acknowledgment of some message she supposedly received from a spirit, which she was to impart to me. I paid the medium thirty dollars cash and

considered it a bargain—although not in the way the spiritualist would no doubt have hoped.

At both of the billet readings I attended that were conducted for audiences (one in a chapel, the other in the cathedral), a volunteer stood inside the doorway and handed each of us a slip of paper. Printed instructions at the top directed us to "Please address your billet to one or more loved ones in spirit, giving first and last names. Ask one or more questions and sign your full name."

On the first occasion I made a point of seeming uncertain about how to fold the paper and was told that it was to be simply doubled over and creased; if it was done otherwise, I was told strictly, the medium would not read it. I did not ask why, since I tried to seem as credulous as possible, but in fact I knew that there were two reasons. First, of course, the billets needed to be easy to open with a flick of the thumb, and second, it was essential that they all look alike. The reason for the latter condition lay in the method employed: After the slips were gathered in a collection plate and dumped atop the lectern (where they could not be seen from our vantage point) the medium would pick one up and hold it to his or her forehead while divining its contents. The trick involves secretly glancing down at an open billet. A sitter who had closed his slip in a distinctive way (such as by pleating it or folding it into a triangle) might notice that the billet being shown was not the one apparently being viewed clairvoyantly.

The insistence on how the paper must be folded indicated trickery. And that was confirmed for me at one session through my writing the names of non-existent loved ones and signing with my pseudonym. From near the back of the chapel I acknowledged the medium's announcement that he was "getting the Collins family." After revealing the bogus names I had written, he gave me an endearing message from my supposedly departed mother that answered a question I had addressed to her on the billet. However, my mother was actually among the living and, of course, not named Collins.

The other public billet reading I attended was part of a Gala Service held in the Cathedral. The medium placed adhesive strips over her eyes followed by a scarf tied in blindfold fashion. This is obviously supposed to prove that the previously described method of billet reading was not employed, but according to Keene (1976, 45), who performed the same feat, "The secret here was the old mentalist standby: the peek down the side of the nose." He adds: "No matter how securely the eyes are blindfolded, it's always possible to get enough of a gap to read material held close to the body." Unfortunately, at this reading my billet was not among those chosen, so there were no special communications from the non-existent persons whose names I had penned.

Spirit Writing

Another feat practiced by at least three mediums at Chesterfield is called "spirit card writing." This descends from the old slate effects that were common during the heyday of spiritualism, whereby (in a typical effect) alleged otherworldly writing mysteriously appeared on the inner surfaces of a pair of slates that were bound together (Nickell 2000). In the modern form (which exists in several variants), blank cards are placed in a basket along with an assortment of pens, colored pencils, etc. After a suitable invocation, each of the cards is seen typically to bear a sitter's name surrounded by the names of his "spirit guides" or other entities and possibly a drawing or other artwork. The sitter keeps the card as a tangible "proof" of spirit power.

At Chesterfield one afternoon I attempted to sign up for a private card-writing séance later that evening at the home of a prominent medium (who also advertises other feats including "pictures on silk"). When that session proved to be filled, I decided to try to "crash" the event and soon hit on a subterfuge. I placed the autograph of "Jim Collins" on the sign-in sheet for the *following* week, then showed up at the appointed time for the current séance a few hours later. I milled about with the prospective sitters, and then we were all ushered into the séance room in the medium's bungalow.

So far so good. Unfortunately when he read off the signees' names and I was unaccounted for, I had some explaining to do. I insisted I had signed the sheet and let him discover the "error" I had made. Then, suitably repentant and deeply disappointed, I implored him to allow me to stay, noting that there was more than one extra seat. Of course, if the affair were bogus, and the cards prepared in advance, I could not be permitted to participate. Not surprisingly I was not, being given the lame excuse (by another medium, a young woman, who was sitting in on the session) that the medium needed to prepare for the séance by "meditating" on each sitter's name. (I wondered which of the two types of mediums she was: one of the "shut-eyes," simple believers who fancy that they receive psychic impressions, or one of the "open mediums," who acknowledge their deceptions within the secret fraternity [Keene 1976, 23].) Even without my admission fee, I estimate the medium grossed approximately $450.

The next day I sought out one of the sitters who consoled me over my not having been accepted for the séance. She showed me her card which bore a scattering of names like "Gray Wolf" in various colors of felt-pen handprinting—all appearing to me on brief inspection to have been done by one person. The other side of the card bore a picture (somewhat resembling a Japanese art print) that she thought had also been produced by spirits, although I do not know exactly what was claimed by the medium. I did examine the picture with the small lens on my Swiss army knife which revealed the telltale pattern of dots from the halftone printing process. The woman seemed momentarily discomfited when I showed her this and indeed acknowledged that the whole thing seemed hard to believe, but she stated that she simply *chose* to believe. I nodded understandingly; I was not there to argue with her.

"Direct Voice"

My most memorable—and unbelievable—experience at Camp Chesterfield involved a spirit materialization séance I attended at a medium's cottage on a Sunday morning. Such offerings are not scheduled in the camp's guidebook but are rather advertised via a sign-in book,

and, perhaps an accompanying poster, on the medium's porch. As my previous experience showed, it behooved one to keep abreast of the various offerings around the village. So I was out early in the morning, hobbling with my cane up and down the narrow lanes. Soon, a small poster caught my eye: "Healing Séance with Apports." It being just after 6:00 A.M., and the streets silent, I quietly stepped onto the porch and signed up for the 10:00 A.M. session.

At the appointed time seven of us had gathered and the silver-haired medium ushered us into the séance room which she promptly secured against light leakage, placing a rolled-up throw rug at the bottom of the outer door and another rolled cloth to seal the top, and closing a curtain across an interior door. She collected twenty-five dollars from each attendee and then, after a brief prayer, launched into the healing service. This consisted of a "pep talk" (as she termed it) followed by a brief session with each participant in which she clasped the person's hands and imparted supposed healing energies.

It eventually came time for the séance. A pair of tin spirit trumpets standing on the floor by the medium's desk suggested we might experience "direct voice," by which spirits supposedly speak, the trumpets often being used to amplify the vocalizations. The medium began by turning off the lamps and informing us that "dark is light." Soon, in the utter blackness, the voices came, seeming to be speaking in turn through one of the trumpets. Keene (1976, 104–108) details various means of producing "levitating" trumpets, complete with luminescent bands around them "so that the sitters could see them whirling around the room, hovering in space, or sometimes swinging back and forth in rhythm with a hymn." But here, however, we were left to our imaginations. Mine suggested to me that the medium was not even bothering to use the large trumpet, which might prove tiresome, but may have been utilizing a small tin megaphone—another trick described by Keene.

Some mediums were better at pretending direct voice than others; sometimes, according to one critic, "All the spirit voices sounded exactly like the medium . . ." (Keene 1976, 122). Such was the case at my séance. The first voice sounded just like the medium using exaggerated enunciation to simulate an "Ascended Master" (who urged the rejection of negativity); another sounded just like the medium adopting the craggy voice of "Black Elk" (with a message about having respect for the Earth); and still another sounded just like the medium using a perky little-girl voice to conjure up "Miss Poppy" (supposedly one of the medium's "joy guides").

At the end of the séance, after the lights were turned back on, one of the trumpets was lying on its side on the floor, as if dropped there by the spirits—or, as I thought, simply tipped over by the medium. Finally, we were invited up to get our "apports."

Apports

Supposedly materialized or teleported gifts from the spirits, apports appear at some séances under varying conditions—sometimes tumbling out of a spirit trumpet, for example. Keene (1976, 108) says those at Camp Chesterfield were typically "worthless trinkets" such as broaches or rings often "bought cheap in bulk." One medium specialized in "spirit jewels" (colored glass) while another apported arrowheads; special customers might receive something "more impressive." Camp Chesterfield instructed its apport mediums to ". . . *please ask your guides* to bring articles of equal worth to each sitter and not to bring only one of such articles as are usually in pairs (earrings or cufflinks, for instance)" (quoted from "The Medium's Handbook" by Keene 1976, 63).

At our séance the apports were specimens of hematite which (like many other stones) has a long tradition of alleged healing and other powers (Kunz 1913). The shiny, steel-gray mineral had obviously been tumbled (mechanically polished), as indicated by surface characteristics shown by stereomicroscopic examination, and was indistinguishable from specimens purchased in shops that sell such New Age talismans.

The medium handed each of us one of the seven stones after picking it up with a tissue and noting with delight our reaction at discovering it was icy cold! This was a nice touch, I thought, imparting an element of unusualness as if somehow consistent with having been materialized from the Great Beyond—although probably only kept by the medium in her freezer until just before the séance when it was likely transferred to a thermos jar. We were told that each apport was attuned to that sitter's own energy "vibrations" and that no one else should ever be permitted to touch it. If someone did, we were warned, it would become "only a stone."

I left Camp Chesterfield on the morning of my fifth day there, after first taking photographs around the village. As I reflected on my experiences, things seemed to have changed little from the time Keene wrote about in *The Psychic Mafia.* Indeed the deceptions harkened back to the days of Houdini and beyond—actually, all the way back to 1848 when the Fox sisters launched the spiritualist craze with their schoolgirl tricks.

Acknowledgments

I am grateful to Brant Abrahamson of Brookfield, Illinois, who was prompted by my investigations of spiritualism to send me some materials he obtained while stopping at Camp Chesterfield during a trip. The materials helped seal my resolve to visit the site.

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PSYCHIC VIBRATIONS
ROBERT SHEAFFER

Give Me Disclosure, or Give Me Death!

The brouhaha from "The Disclosure Project" (see "UFO Believers Sighted in Nation's Capital!" by Joel Achenbach, SI September/October 2001, pp. 7–8) continues to reverberate throughout UFOlogy and beyond. At the May 9, 2001, kickoff press conference at the National Press Club in Washington, D.C. organized by Dr. Steven Greer, the head of the UFO group CSETI, "more than 20 military, government and corporate witnesses to unambiguous UFO and extraterrestrial events stated their testimony before millions" (www.disclosureproject.org/). The event was carried live on the Web, resulting in the largest audience by far for any Web cast from the National Press Club, overloading the servers.

Many elements of the news media gave largely uncritical accounts of the event, leading the public to suspect that the claims might well have some validity. In a story dated May 11, the ABC News Web site headlined "Former Government Employees Say It's Time to Reveal Evidence," adding "They're out there—and the government knows." Fox News reported on May 10, "A group of twenty-one former military and government officials told a packed house at the National Press Club stories worthy of a whole episode of the *The X-Files* Wednesday. These men in suits spoke of high-speed saucers, crashed ships, alien bodies, and conspiracies of silence."

While the BBC coverage suggested at least some degree of humor and doubt (http://news.bbc.co.uk/hi/english/world/americas/newsid_1322000/1322432.stm), the *U.K. Independent* reported, "Yesterday twenty witnesses from the American military, intelligence services, and scientific establishments gave their testimony to start a campaign which they hope will force the government to investigate the UFO phenomenon." Even Russia's *Pravda* jumped into the fray, its headline of May 12 proclaiming "American Scientists Demand to Publish the Information about UFO Accumulated During Fifty Years." The only really skeptical account outside the skeptical movement came from *Wired* magazine: "Ooo-WEE-ooo Fans Come to D.C." (www.wired.com/news/culture/0,1284,43526,00.html.html).

Greer has now taken his show on the road, giving "Campaign for Disclosure" presentations in many North American cities including San Francisco, Miami, Los Angeles, Toronto, New York, and Vancouver. In each city, the show begins with "an exclusive showing of the two-hour Disclosure film of fifty government and military witnesses to UFO and Extraterrestrial events and projects," followed by a presentation from Greer.

What most media uniformly failed to report were the many absurd statements that were a dead giveaway to anyone having even a quarter of a brain that the entire event was an exercise in surrealism, and not "disclosure." Frequent reference was made to "zero-point energy" and to "anti-gravity," which should have been red flags to any knowledgeable reporter. My favorite howler was Greer's matter-of-fact statement that "superluminal" (i.e., faster-than-light) alien craft had been reverse-engineered, and were now being manufactured by Lockheed Martin. If Greer is correct, not only is there a secret government covertly calling the shots, but also a secret realm of earthly technology that has ready access to undreamed-of capabilities, based upon a secret physics that knows all about "superluminal" travel and other miracles, but whose priesthood has managed to keep the astonishing news completely hidden from their students, mentors, and other professional colleagues. (The first two I find extremely difficult to believe, the last one impossible.) Compounding the Project's incredibility is the great emphasis on "free energy" claims, that "the internal combustion engines, the fossil fuel plants, gas, oil, coal, and ionizing nuclear technology" are all obsolete, a fact that the government is working very hard to cover up to protect the vested interests of those industries.

As for the "credible witnesses" that Greer has assembled, none of them can produce a single shred of evidence

Robert Sheaffer's World Wide Web page for UFOs and other skeptical subjects is at www.debunker.com.

beyond their own unsupported words. Worse yet, many of them carry such baggage that believing what they say becomes a Herculean task.

Sergeant Cliff Stone testified about having participated in the recovery of a crashed extraterrestrial spacecraft in Indian Town Gap, Pennsylvania, in 1969, complete with alien casualties. (Somehow the people in this town have been unable to capitalize on their very own UFO crash as the folks have in Roswell.) Stone earlier claimed to have seen crashed saucers in the basement of the Pentagon. He also claims that while he was serving in Vietnam, he was sent to recover a downed B-52 that looked as if it had been simply "plucked from the sky and set down in the jungle" by a UFO.

Daniel Sheehan is well known as a lawyer for "progressive" causes. He was involved in the Pentagon Papers case, the lawsuit over Karen Silkwood's death, and many other high-profile cases. He headed up a group called the Christic Institute, which in the 1980s filed wide-ranging lawsuits claiming that the CIA had set up a giant "secret government" based on drug smuggling, assassination, etc. *Apparently they were also* involved in the assassination of JFK. This lawsuit made big news as it dragged through the courts for years, deposing large numbers of government officials, until the courts finally dismissed it as having no merit. Prior to Sheehan's recent "recovered memory" of having been shown the proof of captured UFOs, his claims of CIA conspiracies had already earned their niche among the "60 greatest conspiracies of all time" (see www.conspire.com/sheehan.html).

But Sheehan didn't say a word at that time about his fantastic UFO discoveries: he claims to have seen the "proof" of secret crashed saucers during the closing months of the Ford administration in 1976, but he said absolutely nothing about it until the year 2001, despite spending much of the 1980s and 1990s in front of news cameras, beating the drum about bizarre government "conspiracies." Were it not for this fortunate and sudden recollection of his astonishing experience, Sheehan might yet still be completely out of the news and the public eye.

Carol Rosin is a long-time leftist activist (see www.peaceinspace.com) who claims to have been a spokesperson for the late Werner von Braun. She, too, seems to have very recently discovered the significance of UFOs. She had been a long-time campaigner against all space-based weapons, whether offensive or defensive. Her role in the Disclosure Project was "to testify that the early space pioneer warned of the dangers of space-based weapons and that covert programs were planning to eventually justify them by manufacturing a threat from outer space which does not exist." She did not actually make any UFO claims.

Former U.S. airman Larry Warren is well known in UFO circles as a supposed witness to alleged 1980 UFO encounters at Bentwaters, U.K., "the British Roswell." His yarns about the Bentwaters incident has been extensively debunked (see www.ufoworld.co.uk/v14.txt). At the Disclosure press conference, Warren told of allegedly being debriefed after his encounters by being shown a secret government film. Not only did the film reveal the existence of extraterrestrials, it even showed Apollo astronauts on the Moon pointing out artificial alien structures.

Gerald Fried

Astronaut Gordon Cooper told how he had seen a film taken of a UFO landing at Edwards Air Force Base, California, in the 1950s. The film was allegedly sent to Washington, but subsequently "disappeared." Greer comments that "his testimony cannot be contradicted because of the credibility that this great man has." Perhaps, but it also cannot be substantiated, and Cooper's "credibility" is seriously compromised by his history of making extraordinary claims that don't check out (see James Oberg's in-depth analysis of Cooper's UFO claims at www.zip.com.au/~psmith/cooper.html).

Greer claimed Apollo astronaut Edgar Mitchell as one of his sources. Goodness knows that Mitchell has certainly endorsed enough *other* paranormal absurdities so that his participation here would hardly surprise us. However, Mitchell has stated unequivocally, "I cooperated with Steve Greer some years ago, but he began to overreach his data continuously, necessitating a withdrawal by myself, and, I believe, several others. I have requested to be removed from any Web site, announcements, etc., but see that has not taken place . . . [neither] I, nor any crew I was on (I was on three Apollo crews), received any briefing before or after flights on UFO events, saw anything in space suggesting UFOs or structures on the Moon, etc." As of the time of this writing, Mitchell's name still remains on the Disclosure Project

Web site as a supporting witness.

As you go down Greer's list of 400 allegedly supporting witnesses, it does not get any better. Gene Mallove is a cold-fusionist. Paul LaViolette calls himself the "new Einstein." Thomas Bearden has been writing bizarre papers about "noncausal phenomena" and other mumbo-jumbo for decades. Glen Dennis is a former mortician whose claims to have seen alien bodies at Roswell has been shown by skeptic Philip J. Klass to be "riddled with flaws and inconsistencies" (see www.csicop.org/klassfiles/SUN-31.html).

Other gaping holes in the Disclosure fabric were soon spotted by other researchers. British researcher James Easton noted that Greer's "executive summary" contains a number of demonstrably false claims: A woman who claimed witnessing UFO activity at the RAF base in Bentwaters, U.K. in 1980 had in fact left the base well before that incident, and Greer also repeats the false claim that astronaut Gordon Cooper had filmed a UFO in space, but the film later "disappeared." Skeptic James Oberg noted that Greer's witness Donna Hare, who claims having seen NASA airbrush out an image of a UFO in a photo before releasing it, also claims to have seen trees and their shadows on the ground in these pictures taken from orbit—a physical impossibility, given their low resolution.

Greer's Disclosure Project has been slowly evolving from a movement to publicize UFOs into a movement to oppose all space-based weapons or defenses (which fits in with the agenda of Sheehan and Rosen), and apparently to oppose all military action whatever. (A cynic might conclude that the only interest Sheehan and Rosen have in Greer's UFO project is his ability to get them in front of news cameras.) Recently, the Disclosure Project has joined with a large number of leftist groups in an "International Day of Protest" to oppose not only the "militarization of space" but also "the war in Central Asia" (i.e., Afghanistan—see www.globenet.free-online.co.uk/actions/oct01.htm).

Recently Greer has sunk so low as to attempt to exploit the tragedies of September 11 to advance his sagging cause.

Lara Johnstone of Berkeley, California was so moved by Greer's ideas that on July 28 she began a hunger strike to demand full "disclosure," allowing herself to drink only water, vitamins, and juice. "I am asking President Bush to fulfill his campaign promise, and make public information on U.S. government involvement with extraterrestrial craft, technologies, and civilizations by supporting the Disclosure witnesses who are ready to testify before the U.S. Congress about their extensive knowledge of the Extraterrestrial presence," she wrote (see www.ecology-news.com/cuenews38.html). Despite the publicity Johnstone received in the UFO press and on Art Bell, the president ignored her repeated urgings for a response. Finally on September 9, day forty-four of her hunger strike, Johnstone called it off by eating a burger—"a small vegetable one," she hastily added.

Recently, Greer has sunk so low as to attempt to exploit the tragedies of September 11 to advance his sagging cause. "We Need Your Help to Disclose the Secrets that could have Prevented the September 11th Tragedy. Hear how Classified Projects are withholding Technologies that could Replace our need for Oil," proclaims the Disclosure Web site. "The good news is that the Disclosure Project can prove that we have a replacement for oil, coal, and conventional energy. In a decade we could reach energy independence: bin Laden et al. may keep their oil, for we will not need it." The bad news is that these supposed energy replacements are no more real than Greer's wild saucer claims.

Indeed, so absurd are many of the claims of Greer et al. that a substantial backlash against them is underway within UFOlogy. Pro-UFO researcher Robert Swiatek has noted Greer's "often radical and unsupported pronouncements, as well as the considerable problems that they have created for serious, scientifically-inclined UFO and abduction researchers." Many UFOlogists are also troubled by Greer's contention that the aliens are friendly toward humans, or at least not hostile. It is widely accepted by many abduction researchers that the motivations behind UFO abductions are positively sinister. For example, David Jacobs writes in *The Threat* that "the abduction phenomenon is far more ominous than I had thought. Optimism is not the appropriate response to the evidence, all of which strongly suggests that the alien agenda is primarily beneficial for them and not for us. I know why the aliens are here—and what the human consequences will be if their mission is successful." From this perspective, Greer's "peaceful alien" scenario is not only misleading, but fraught with peril. Michael Brownlee writes,

> it appears that one of the hidden objectives of Greer's CSETI disclosure effort may be to deflect investigation away from the extraterrestrials themselves. They remain almost completely absent from his disclosure documents. Rather than entertain questions or evidence about the ETs, Greer is quick to deflect such discussion. He consistently responds to any concern about ET motives or intentions with his standard scathing reply: "There is no evidence that any of them are hostile. So therefore there is no objective threat" [www.visibiliti.com/awakenings/disclosure.htm].

Thus while some UFOlogists worry that the obviously low credibility of the Disclosure Project will wrongfully taint the public perception of "serious" UFOlogy, others are concerned that Greer's sanguine estimation of alien intentions leaves us unprepared for the coming alien holocaust, once their cross-breeding program has been completed.□

Bigfoot at 50

Evaluating a Half-Century of Bigfoot Evidence

The question of Bigfoot's existence comes down to the claim that "Where there's smoke there's fire." The evidence suggests that there are enough sources of error that there does not have to be a hidden creature lurking amid the unsubstantiated cases.

BENJAMIN RADFORD

Though sightings of the North American Bigfoot date back to the 1830s (Bord 1982), interest in Bigfoot grew rapidly during the second half of the twentieth century. This was spurred on by many magazine articles of the time, most seminally a December 1959 *True* magazine article describing the discovery of large, mysterious footprints the year before in Bluff Creek, California.

A half century later, the question of Bigfoot's existence remains open. Bigfoot is still sought, the pursuit kept alive by a steady stream of sightings, occasional photos or footprint finds, and sporadic media coverage. But what evidence has been gathered over the course of fifty years? And what conclusions can we draw from that evidence?

Most Bigfoot investigators favor one theory of Bigfoot's origin or existence and stake their reputations on it, sniping at others who don't share their views. Many times, what one investigator sees as clear evidence of Bigfoot another will dismiss out of hand. In July 2000, curious tracks were found on the Lower Hoh Indian Reservation in Washington state. Bigfoot tracker Cliff Crook claimed that the footprints were "for sure a Bigfoot," though Jeffrey Meldrum, an associate professor of biological sciences at Idaho State University (and member of the Bigfoot Field Research Organization, BFRO) decided that there was not enough evidence to pursue the matter (Big Disagreement Afoot 2000). A set of tracks found in Oregon's Blue Mountains have also been the source of controversy within the community. Grover Krantz maintains that they constitute among the best evidence for Bigfoot, yet longtime researcher René Dahinden claimed that "any village idiot can see [they] are fake, one hundred percent fake" (Dennett 1994).

And while many Bigfoot researchers stand by the famous 16 mm Patterson film (showing a large manlike creature crossing a clearing) as genuine (including Dahinden, who shared the film's copyright), others including Crook join skeptics in calling it a hoax. In 1999, Crook found what he claims is evidence in the film of a bell-shaped fastener on the hip of the alleged Bigfoot, evidence that he suggests may be holding the ape costume in place (Dahinden claimed the object is matted feces) (Hubbell 1999).

Regardless of which theories researchers subscribe to, the question of Bigfoot's existence comes down to evidence— and there is plenty of it. Indeed, there are reams of documents about Bigfoot—filing cabinets overflowing with thousands of sighting reports, analyses, and theories. Photographs have been taken of everything from the alleged creature to odd tracks left in snow to twisted branches. Collections exist of dozens or hundreds of footprint casts from all over North America. There is indeed no shortage of evidence.

The important criterion, however, is not the *quantity* of the evidence, but the *quality* of it. Lots of poor quality evidence does not add up to strong evidence, just as many cups of weak coffee cannot be combined into a strong cup of coffee.

Bigfoot evidence can be broken down into four general types: eyewitness sightings, footprints, recordings, and somatic samples (hair, blood, etc.). Some researchers (notably Loren Coleman 1999) also place substantial emphasis on folklore and indigenous legends. The theories and controversies within each category are too complex and detailed to go into here. I present merely a brief overview and short discussion of each; anyone interested in the details is encouraged to look further.

Benjamin Radford has been to the area of Bigfoot and wildman sightings in North and Central America, and was interviewed on mysterious creatures for The Ultimate Ten Mysteries, *which appeared on The Learning Channel. He is co-author of* Hoaxes, Myths, and Manias: Why We Need Critical Thinking, *to be published by Prometheus Books later this year.*

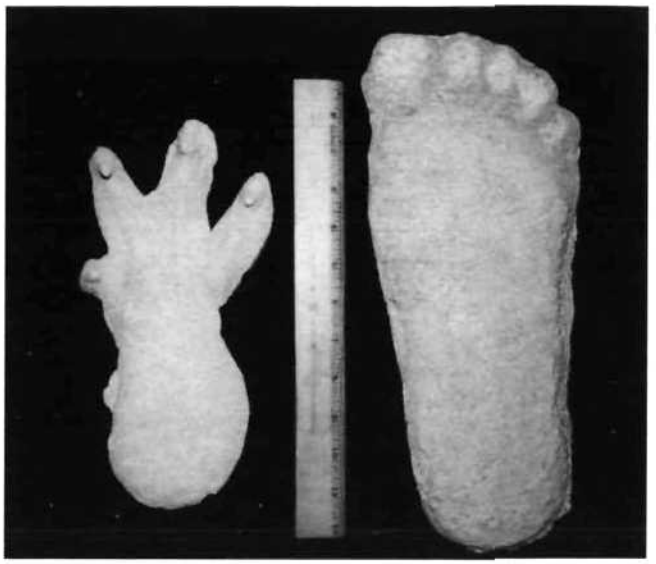

Figure 1. Casts from two alleged Bigfoot encounters. The cast on the left is from a Louisiana Bigfoot, the one on the right is from California. Photo by Benjamin Radford.

1. Eyewitness Accounts

Eyewitness accounts and anecdotes comprise the bulk of Bigfoot evidence. This sort of evidence is also the weakest. Lawyers, judges, and psychologists are well aware that eyewitness testimony is notoriously unreliable. As Ben Roesch, editor of *The Cryptozoological Review*, noted in an article in *Fortean Times*, "Cryptozoology is based largely on anecdotal evidence. . . . [W]hile physical phenomena can be tested and systematically evaluated by science, anecdotes cannot, as they are neither physical nor regulated in content or form. Because of this, anecdotes are not reproducible, and are thus untestable; since they cannot be tested, they are not falsifiable and are not part of the scientific process. . . . Also, reports usually take place in uncontrolled settings and are made by untrained, varied observers. People are generally poor eyewitnesses, and can mistake known animals for supposed cryptids [unknown animals] or poorly recall details of their sighting. . . . Simply put, eyewitness testimony is poor evidence" (Roesch 2001).

Bigfoot investigators acknowledge that lay eyewitnesses can be mistaken, but counter that expert testimony should be given much more weight. Consider Coleman's (1999) passage reflecting on expert eyewitness testimony: "[E]ven those scientists who have seen the creatures with their own eyes have been reluctant to come to terms with their observations in a scientific manner." As an example he gives the account of "mycologist Gary Samuels" and his brief sighting of a large primate in the forest of Guyana. The implication is that this exacting man of science accurately observed, recalled, and reported his experience. And he may have. But Samuels is a scientific expert on tiny fungi that grow on wood. His expertise is botany, not identifying large primates in poor conditions. Anyone, degreed or not, can be mistaken.

2. Footprints

Bigfoot tracks are the most recognizable evidence; of course, the animal's very name came from the size of the footprints it leaves behind. Unlike sightings, they are physical evidence: *something* (known animal, Bigfoot, or man) left the tracks. The real question is what the tracks are evidence of. In many cases, the answer is clear: they are evidence of hoaxing.

Contrary to many Bigfoot enthusiasts' claims, Bigfoot tracks are not particularly consistent and show a wide range of variation (Dennett 1996). Some tracks have toes that are aligned, others show splayed toes. Most alleged Bigfoot tracks have five toes, but some casts show creatures with two, three, four, or even six toes (see figure 1). Surely all these tracks can't come from the same unknown creature, or even species of creatures.

Not all prints found are footprints, though. In September 2000, a team of investigators from the Bigfoot Field Research Organization led an expedition near Mt. Adams in Washington state, finding the first Bigfoot "body print," which—if authentic—is arguably the most significant find in the past two decades. The Bigfoot, according to the team, apparently made the impression when it laid on its side at the edge of a muddy bank and reached over to grab some bait. This of course raises the question as to why the animal would make such an odd approach to the food, instead of simply walking over to it and taking it. As the log of the expedition reads, "One explanation is immediately apparent—the animal did not want to leave tracks. . . ." (BFRO 2000). This explanation fails on its own logic: If the Bigfoot (or whatever it was) was so concerned about not leaving traces of its presence, why did it then leave a huge fifteen-square-foot imprint in the mud for the team to find?[1]

3. Recordings

The Patterson Film

The most famous recording of an alleged Bigfoot is the short 16 mm film taken in 1967 by Roger Patterson and Bob Gimlin. Shot in Bluff Creek, California, it shows a Bigfoot striding through a clearing (see figure 2). In many ways the veracity of the Patterson film is crucial, because the casts made from those tracks are as close to a gold standard as one finds in cryptozoology. Many in the Bigfoot community are adamant that the film is not—and, more important—*cannot* be a hoax. The question of whether the film is in fact a hoax or not is still open, but the claim that the film *could not* have been faked is demonstrably false.

Grover Krantz, for example, admits that the size of the creature in the film is well within human limits, but argues that the chest width is impossibly large to be human. "I can confidently state that no man of that stature is built that broadly," he claims (Krantz 1992, 118). This assertion was examined by two anthropologists, David Daegling and Daniel Schmitt (1999), who cite anthropometric literature showing the "impossibly wide" chest is in fact within normal human variation. They also disprove claims that the Patterson creature walks in a manner impossible for a person to duplicate.

The film is suspect for a number of reasons. First, Patterson told people he was going out with the express purpose of capturing a Bigfoot on camera. In the intervening thirty-five years (and despite dramatic advances in technology and wide distribution of handheld camcorders), thousands of people have gone in search of Bigfoot and come back empty-handed (or with little but fuzzy photos). Second, a known Bigfoot track hoaxer claimed to have told Patterson exactly where to go to see the Bigfoot on that day (Dennett 1996). Third, Patterson made quite a profit from the film, including publicity for a book he had written on the subject and an organization he had started.

Figure 2. A frame from the film shot by Roger Patterson in Bluff Creek, California, in 1967. The subject is said to be a female Bigfoot.

In his book *Bigfoot*, John Napier, an anatomist and anthropologist who served as the Smithsonian Institution's director of primate biology, devotes several pages to close analysis of the Patterson film (pp. 89–96; 215–220). He finds many problems with the film, including that the walk and size is consistent with a man's; the center of gravity seen in the subject is essentially that of a human; and the step length is inconsistent

with the tracks allegedly taken from the site. Don Grieve, an anatomist specializing in human gait, came to the conclusion that the walk was essentially human in type and could be made by a modern man. Napier writes that "there is little doubt that the scientific evidence taken collectively points to a hoax of some kind."

Credit: Cliff Crook/Fortean Picture Library

Figure 3. Bigfoot allegedly photographed on July 11, 1995, by forest patrol officer at Wild Creek in Mount Rainier foothills, Washington State.

Other films and photos of creatures supposed to be Bigfoot have appeared, perhaps best-known among them the Wild Creek photos allegedly purchased by Cliff Crook of Bigfoot Central from an anonymous park ranger (see figure 3).

Bigfoot Voices

One of the more interesting bits of "evidence" offered for the existence of Bigfoot is sound recordings of vocalizations. One company, Sierra Sounds, markets a CD called "The Bigfoot Recordings: The Edge of Discovery." Narrated by Jonathan Frakes (an actor who also narrated a special on the infamous "Alien Autopsy" hoax), the recording claims to have captured vocalizations among a Bigfoot family. The sounds are a series of guttural grunts, howls, and growls.

The Web site and liner notes offer testimonials by "expert" Nancy Logan. Logan, their "linguist," apparently has little or no actual training (or degree) in linguistics. Her self-described credentials include playing the flute, speaking several languages, and having "a Russian friend [who] thinks I'm Russian." Logan confidently asserts that the tapes are not faked, and that the vocal range is too broad to be made by a human. She suggests that the Bigfoot language shows signs of complexity, possibly including profanities: "On one spot of the tape, an airplane goes by and they seem to get very excited and not very happy about it. Maybe those are Sasquatch swear words."

Here's what Krantz writes about Bigfoot recordings: "One... tape was analyzed by some university sound specialists who determined that a human voice could not have made them; they required a much longer vocal tract. A sasquatch investigator later asked one of these experts if a human could imitate the sound characteristics by simply cupping his hands around his mouth. The answer was yes" (Krantz 1992, 134). As for other such recordings, Krantz has "listened to at least ten such tapes and find[s] no compelling reason to believe that any of them are what the recorders claimed them to be" (133).

4. Somatic Samples

Hair and blood samples have been recovered from alleged Bigfoot encounters. As with all the other evidence, the results are remarkable for their inconclusiveness. When a definite conclusion has been reached, the samples have invariably turned out to have prosaic sources—"Bigfoot hair" turns out to be elk, bear, or cow hair, for example, or suspected "Bigfoot blood" is revealed to be transmission fluid. Even advances in genetic technology have proven fruitless. Contrary to popular belief, DNA cannot be derived from hair samples alone; the root (or some blood) must be available.

In his book *Big Footprints*, Grover Krantz (1992) discusses evidence for Bigfoot other than footprints, including hair, feces, skin scrapings, and blood: "The usual fate of these items is that they either receive no scientific study, or else the documentation of that study is either lost or unobtainable. In most cases where competent analyses have been made, the material turned out to be bogus or else no determination could be made" (125). He continues, "A large amount of what looks like hair has been recovered from several places in the Blue Mountains since 1987. Samples of this were examined by many supposed experts ranging from the FBI to barbers. Most of these called it human, the Redkin Company found significant differences from human hair, but the Japan Hair Medical Science Lab declared it a synthetic fiber. A scientist at [Washington State] University first called it synthetic, then looked more closely and decided it was real hair of an unknown type. . . . Final confirmation came when E.B. Winn, a pharmaceutical businessman from Switzerland, had a sample tested in Europe. The fiber was positively identified as artificial and its exact composition was determined: it is a product known commercially as Dynel, which is often used as

imitation hair." In his analysis, Winn (1991) noted that another alleged Bigfoot sign found at the site, tree splintering, had also been faked.

Hoaxes, the Gold Standard, and the Problem of Experts

Such hoaxes have permanently and irreparably contaminated Bigfoot research. Skeptics have long pointed this out, and many Bigfoot researchers freely admit that their field is rife with fraud. This highlights a basic problem underlying all Bigfoot research: the lack of a standard measure. For example, we know what a bear track looks like; if we find a track that we *suspect* was left by a bear, we can compare it to one we *know* was left by a bear. But there are no undisputed Bigfoot specimens by which to compare new evidence. New Bigfoot tracks that don't look like older samples are generally not taken as proof that one (or both) sets are fakes, but instead that the new tracks are simply from a different Bigfoot, or from a different species or family. This unscientific lack of falsifiability plagues other areas of Bigfoot research as well.

Bigfoot print hoaxing is a time-honored cottage industry. Dozens of people have admitted making Bigfoot prints. One man, Rant Mullens, revealed in 1982 that he and friends had carved giant Bigfoot tracks and used them to fake footprints as far back as 1930 (Dennett 1996). In modern times it is easier to get Bigfoot tracks. With the advent of the World Wide Web and online auctions, anyone in the world can buy a cast of an alleged Bigfoot print and presumably make tracks that would very closely match tracks accepted by some as authentic.

What we have, then, are new tracks, hairs, and other evidence being compared to *known* hoaxed tracks, hairs, etc. as well as *possibly* hoaxed tracks, hairs, etc. With sparse hard evidence to go on and no good standard by which to judge new evidence, it is little wonder that the field is in disarray and has trouble proving its theories. In one case, Krantz claimed as one of the gold standards of Bigfoot tracks a print that "passed all my criteria, published and private, that distinguishes sasquatch tracks from human tracks and from fakes" (Krantz 1992). He further agreed that it had all the signs of a living foot, and that no human foot could have made the imprint. Michael R. Dennett, investigating for the SKEPTICAL INQUIRER, tracked down the anonymous construction worker who supplied the Bigfoot print. The man admitted faking the tracks himself to see if Krantz could really detect a fake (Dennett 1994).

Krantz certainly isn't alone in his mistaken identifications. One of the biggest names in cryptozoology, Ivan Sanderson, was badly fooled by tracks he confidently proclaimed would be impossible to fake. In 1948 (and for a decade afterward), giant three-toed footprints were found along the beach in Clearwater, Florida. Sanderson, described as a man who "was extremely knowledgeable on many subjects, and had done more fieldwork than most zoologists do today" (Greenwell 1988), spent two weeks at the site of the tracks investigating, analyzing the tracks, and consulting other experts. He concluded that the tracks were made by a fifteen-foot-tall penguin.

In 1988, prankster Tony Signorini admitted he and a friend had made the tracks with a pair of cast iron feet attached to high-top black sneakers. J. Richard Greenwell, discussing the case in *The ISC Newsletter* (Winter 1988), summed the case up this way: "The lesson to be learned within cryptozoology is, of course, fundamental. Despite careful, detailed analyses by zoologists and engineers, which provided detailed and sophisticated mechanical and anatomical conclusions supporting the hypothesis of a real animal, we now see that, not only was the entire episode a hoax, but that it was perpetrated by relatively amateur, good-natured pranksters, *not* knowledgeable experts attempting, through their expertise, to fool zoological authorities."

The experts, however are only partly to blame for their repeated and premature proclamations of the authenticity of Bigfoot evidence. After all, other areas of science are not fraught with such deception and hoaxing; in physics and biology, light waves and protozoa aren't trying to trick their observers.

Even when there is no intentional hoaxing, "experts" have been fooled. In March 1986, Anthony Wooldridge, an experienced hiker in the Himalayas, saw what he thought was a Yeti (Himalayan Bigfoot) standing in the snow near a ridge about 500 feet away. He described the figure as having a head that was "large and squarish," and the body "seemed to be covered with dark hair." It didn't move or make noise, but Wooldridge saw odd tracks in the snow that seemed to lead toward the figure. He took two photos of the creature, which were later analyzed and shown to be genuine and undoctored. Many in the Bigfoot community seized upon the Wooldridge photos as clear evidence of a Yeti, including John Napier. Many suggested that because of his hiking experience it was unlikely Wooldridge made a mistake. The next year researchers returned to the spot and found that Wooldridge had simply seen a rock outcropping that looked vertical from his position. Wooldridge admitted his misidentification (Wooldridge 1987).

Smoke and Fire

Bigfoot researchers readily admit that many sightings are misidentifications of normal animals, while others are downright hoaxes. Diane Stocking, a curator for the BFRO, concedes that about 70 percent of sightings turn out to be hoaxes or mistakes (Jasper 2000); Loren Coleman puts the figure even higher, at at least 80 percent (Klosterman 1999). The remaining sightings, that small portion of reports that can't be explained away, intrigue researchers and keep the pursuit active. The issue is then essentially turned into the claim that "Where there's smoke there's fire."

But is that really true? Does the dictum genuinely hold that, given the mountains of claims and evidence, there *must* be some validity to the claims? I propose not; the evidence suggests that there are enough sources of error (bad data, flawed methodological

assumptions, mistaken identifications, poor memory recall, hoaxing, etc.) that there does not *have* to be (nor is likely to be) a hidden creature lurking amid the unsubstantiated cases.

The claim also has several inherent assumptions, including the notion that the unsolved claims (or sightings) are qualitatively different from the solved ones. But paranormal research and cryptozoology are littered with cases that were deemed irrefutable evidence of the paranormal, only to fall apart upon further investigation or hoaxer confessions. There will always be cases in which there simply is not enough evidence to prove something one way or the other. To use an analogy borrowed from investigator Joe Nickell, just because a small percentage of homicides remain unsolved doesn't mean that we invoke a "homicide gremlin"—appearing out of thin air to take victims' lives—to explain the unsolved crimes. It is not that such cases are *unexplainable* using known science, just that not enough (naturalistic) information is available to make a final determination.

A lack of information (or negative evidence) cannot be used as positive evidence for a claim. To do so is to engage in the logical fallacy of arguing from ignorance: We don't know what left the tracks or what the witnesses saw, therefore it must have been Bigfoot. Many Bigfoot sightings report "something big, dark, and hairy." But Bigfoot is not the only (alleged) creature that matches that vague description.

The Future for Bigfoot

Ultimately, the biggest problem with the argument for the existence of Bigfoot is that no bones or bodies have been discovered. This is really the 800-pound Bigfoot on the researchers' backs, and no matter how they explain away the lack of other types of evidence, the simple fact remains that, unlike nearly every other serious "scientific" pursuit, they can't point to a live or dead sample of what they're studying. If the Bigfoot creatures across the United States are really out there, then each passing day should be one day closer to their discovery. The story we're being asked to believe is that thousands of giant, hairy, mysterious creatures are constantly eluding capture and discovery and have for a century or more. At some point, a Bigfoot's luck must run out: one out of the thousands must wander onto a freeway and get killed by a car, or get shot by a hunter, or die of natural causes and be discovered by a hiker. Each passing week and month and year and decade that go by without definite proof of the existence of Bigfoot make its existence less and less likely.

On the other hand, if Bigfoot is instead a self-perpetuating phenomenon with no genuine creature at its core, the stories, sightings, and legends will likely continue unabated for centuries. In this case the believers will have all the evidence they need to keep searching—some of it provided by hoaxers, others perhaps by honest mistakes, all liberally basted with wishful thinking. Either way it's a fascinating topic. If Bigfoot exist, then the mystery will be solved; if they don't exist, the mystery will endure. So far it has endured for at least half a century.

Note

1. The way in which the track was discovered raises questions as well. The expedition log gives an account of how "[Team member Richard] Noll notices an unusual impression in the transition mud at the edge of the wallow and suddenly figures out what caused it. [Team members] Fish and Randles note the shock on Noll's face and come over to have another look at what he's examining. The three observe and note the various parts of the impression, and the chunks of chewed apple core nearby. The base camp is alerted. Everyone comes to see the impression. All conclude the animal was laying on its side at the edge of the mud, reaching out over the soft mud to grab the fruit" (BFRO 2000). So what you have is a case where a group of people are looking for evidence of a Bigfoot. One observer believes he sees a pattern fitting what he's looking for in ambiguous stimuli (shapes in mud). Once the pattern is pointed out to others, they also agree that the pattern could match up to parts of a hominid form in a particular contortion. The rest of the group, who might never have decided on their own that the pattern fits a Bigfoot, then validate the initial observer's (possibly unwarranted) conclusion. This happens all the time, for example when a person recognizes a face or an image in clouds or stains or tortillas. As psychologists know, observers' expectations frequently color their interpretations.

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Cripplefoot Hobbled

Evidence for Bigfoot gains credibility when the possibility of human fabrication can be ruled out. The trackways of a crippled Sasquatch are said to provide such a compelling case, but examination of this claim suggests that hoaxing the footprints may have been a fairly manageable endeavor.

DAVID J. DAEGLING

What distinguishes Bigfoot from other alleged contemporary monsters is its propensity to leave physical traces of its activity in the form of footprints. Indeed, the compendium of physical evidence attributed to the beast maintains the legend and has prompted some academics to argue for the animal's authenticity. Arguably the most important Bigfoot trackways were discovered in Bossburg, Washington, late in 1969. Well over 1,000 footprints were left of an allegedly crippled Sasquatch, whose left footprints were "normal" by Bigfoot standards but displayed right footprints betraying a type of acquired or congenital clubfoot deformity (figure 1).

These tracks have convinced several anthropologists that

the Bigfoot phenomenon is attributable to an unidentified primate living in the forests of the Pacific Northwest. John Napier, a world-renowned expert on the evolution of human locomotion, admitted that he could not conceive that the Bossburg tracks were fabricated.[1] Similarly, Grover Krantz has related how the morphology of the Bossburg tracks convinced him of the reality of Sasquatch.[2] More recently, an associate professor of biological sciences at Idaho State University, Jeff Meldrum, identified the deformity as an example of *metatarsus adductus*, and includes the tracks among his examples of alleged Bigfoot prints.[3]

The rationale for accepting the tracks as genuine is summarized by Krantz in his book *Big Footprints:* "I figured the whole thing out after studying the footprints; any hoaxer had to plan it all out from nothing. This requires an expert anatomist with a very inventive mind, more so than me, and I seriously doubt that any such person exists" (1992, 63).

Krantz's opinion, consistent with Napier's and Meldrum's reasoning, is that the preserved imprint of the deformed foot is imbued with so much anatomical detail that the average person would not have the expertise required to fabricate the print. Critical to the argument is the suggestion that the proportions of the foot, in terms of the relative lengths of individual bones reconstructed from the deformed foot imprints, are decidedly nonhuman. Both Krantz and Meldrum agree that the bony proportions implied by the Bossburg tracks are biomechanically consistent with a large body mass significantly beyond human range. A potential hoaxer, it is argued, would be unlikely to understand the subtle functional transformations that would be entailed in scaling up a human foot to a biped of the staggering size of Bigfoot.

Figure 1. A partially corrected clubfoot in a ten-year-old child and the cast of the Bossburg print (right) showing an uncorrected deformity. The Bossburg track is regarded as some of the best evidence for Bigfoot, as proponents of the track's authenticity argue that the prints were unlikely to have been fabricated. Although the details of the child's foot and the Sasquatch print differ, the general proportions of the feet are comparable. From Fripp and Shaw (1967, left) and Dennett (1994, right).

Invention or Imitation?

There is, however, a significant oversight in this argument. The linchpin of the argument is that a hoaxer would have been required to fabricate the details of the Bossburg prints from scratch, yet there is an alternative and far more plausible means of hoaxing such details. This alternative is based on the distinction between invention and imitation.

The possibility neglected by all investigators is that the Bossburg "cripplefoot" is simply an enlarged copy of a human clubfoot deformity. In 1969, textbooks describing congenital foot deformities were commonplace and had been for decades, and images (both photographic and radiographic) had been widely available in such sources.[4] The act of copying such images is a far more likely source of hoaxing than the involved cerebral and technical exercise of fabrication based on anatomical principles. It requires no specialized knowledge beyond tracing and enlarging a two-dimensional image, and the fabricated print of a real deformity ensures the correctness of anatomical detail. Krantz's insistence that a hoaxer must match his training and genius is thus irrelevant.

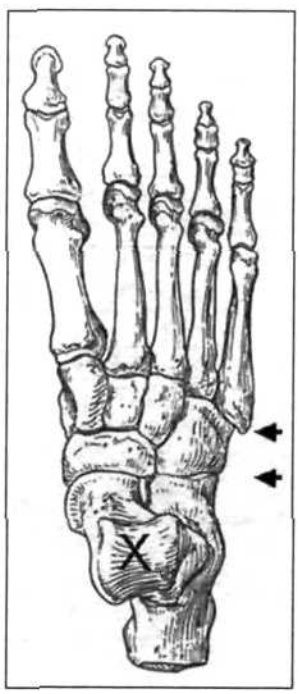

Figure 2. Dorsal (top) view of a normal human foot skeleton. Arrows point to the displaced anatomical joints allegedly responsible for the "bunions" on the pathological Bossburg track. X marks the location of the tibiotalar joint, the position of which was inferred, in part, from the location of these bunions. The tibiotalar joint is claimed to be shifted relatively forward in the Sasquatch foot, even though this joint makes no direct contact with the substrate during walking. Foot skeleton from Kriz (1998).

The argument for authenticity also hinges on the assumption that the footprints show a foot skeleton unique in proportion relative to human feet. If this observation is true, the hypothesis of an imitative hoax is undermined. This claim, however, rests on the assumption that Krantz's skeletal reconstruction of the Bossburg tracks is correct. Several arguments throw into question the accuracy of Krantz's reconstruction. First, the centerpiece of the reconstruction, in terms of establishing a foot that is functionally distinct from the human condition, depends on the correct placement of the tibiotalar joint of the ankle (Dennett 1994), an articulation that is well removed from the plantar surface (sole) of the foot (figure 2).

A second problem is whether the pedal skeleton can be accurately reconstructed from the surface features of the sole of the foot—specifically the location of anatomical joints so crucial to Krantz's argument. The Bossburg track is said to permit this because of the presence of two pathological "bunions" on its lateral (outer) border. These bunions are claimed to correspond to the calcaneocuboid and cubometatarsal joints of the foot, but this

David Daegling is in the Department of Anthropology, University of Florida, P.O. Box 117305, Gainesville FL 32611-7305. E-mail: daegling@anthro.ufl.edu.

assertion lacks supporting clinical evidence or other empirical foundation. It is equally plausible to assign these to unusual prominences of other bones in the region (the cuboid and fifth metatarsal bones or the inconstant sesamoid bones *os peroneum* and *os vesalianum*) or any number of soft tissue pathologies. In any case, between the ball of the foot and the heel there are few landmarks to guide an anatomist to a perfect reconstruction (figure 3).

A third argument, however, may render the preceding objections immaterial. The assumption made to this point is that footprints are accurate reflections of plantar morphology. A recent study by Gatesy et al. (1999) found that track variation among terrestrial birds and dinosaurs is more a function of the substrate (i.e., soil and terrain) than of foot morphology. Thus, in the dynamic context of locomotion, it cannot be assumed that an imprint of a foot bears a perfect image of that foot's structure. Only one set of print casts survives from Bossburg (Dennett 1994), so the variation in the hundreds of tracks left at the scene is unknown.

Figure 3. Footprints of an individual compared to radiographs of their respective foot skeletons. The near identity of the right and left footprints belies the marked differences in skeletal anatomy discerned in the radiograph. This observation reinforces the argument raised by Dennett (1994), that skeletal reconstructions from footprints are prone to error. From Tachdjian (1990).

If one concedes that the tracks preserve the true foot proportions of the hobbled biped (an unanswerable question thirty years after the fact), the uniqueness of the foot that made them can be assessed. If Krantz's claims are taken at face value: 1) that the foot skeleton can be inferred from a footprint and 2) that the reconstructed foot skeleton differs significantly from a human's, then it follows that the morphology of the tracks must also be decidedly nonhuman in their proportions.[5] In examining the normal footprint of the Bossburg Sasquatch, Napier (1972) provides a figure in which a scaled-up human foot is superimposed on the "normal" Bossburg track. The outlines described by the two are very similar—sufficiently comparable in fact that Napier himself described the Bigfoot's print as *human* in outline. If this track is, in fact, nothing more than a gigantic human form, it becomes more mysterious how one concludes from it that Sasquatch feet are biomechanically distinct from those of their puny human cousins. The rejoinder that the reconstruction was derived from the deformed track is vacuous, since then we have to entertain the tortuous argument that somehow the crippled print betrays a once functionally harmonious skeleton while the normal print must be (by virtue of its human form) ill-proportioned for the task of propelling its massive owner.

But what if Napier is simply wrong, and instead we embrace Fahrenbach's (1998) conclusion that Sasquatch feet are not proportionally enlarged human feet? Krantz's assessment of the footprint evidence has led him to conclude that Sasquatch prints are "disproportionately wide" (1992, 52). If the Bossburg tracks exhibit this trait, it would seem that copying and enlarging human prints could be ruled out. But there is a human source for fabrication after all. Human feet change subtly but unmistakably in their shape during development (Scheuer and Black 2000). Infant feet, a typical subject of photographs documenting foot deformities, display relatively wide feet in their outward appearance despite maintaining proportions of bony segments that are similar to those of adults (Hoerr et al. 1962). The outward appearance of infant and young juvenile feet is similar to the shape of the Bossburg tracks (figure 4). A would-be hoaxer, by selecting and enlarging an image of a young person's foot deformity, would produce a Sasquatch track that—intentionally or not—corresponded to shapes seen in the inventory of Bigfoot tracks that existed prior to 1969. One cannot legitimately argue that the correspondence between a hoaxed print and Bigfoot's theoretical ideal is beyond probable: The skeletal reconstruction was based on the footprints themselves and not independently derived.

Napier's difficulty in conceiving of the Bossburg tracks as human fabrications was focused on the underlying motivation of a would-be hoaxer, because he could not imagine why someone would go to the trouble. In the years since the crippled Sasquatch supposedly hobbled through Bossburg, however, many of the details of the entire episode have been forgotten or neglected (Dennett 1994). Ivan Marx, a longtime Bigfoot hunter, was living in Bossburg at the time the tracks began to appear and eventually shot a film of the crippled Sasquatch. It is universally regarded as a hoax even among the staunchest Bigfoot advocates, though no one has specifically settled on who should receive proper credit for the fraud.[6] The allegation of Hunter and Dahinden (1973, 170) that Marx was seen purchasing a number of furs in Spokane before the film was made was also not encouraging to the core of potential believers. Adding to the intrigue were claims by other parties of a Sasquatch foot stashed in a Portland freezer and a still-breathing Bigfoot being trapped in an undisclosed mineshaft (Hunter and Dahinden 1973). Neither bodies nor parts thereof ever materialized, but tens of thousands of dollars were offered

with respect to these items and the film. Smaller amounts of currency actually did change hands in the course of attempts to maintain or secure access to the alleged bits of evidence. The presence of cash transactions in Bossburg provides the motivation for potential hoaxers that Napier could not fathom.

Conclusion

In their discussions of the Bossburg evidence, the three anthropologists apparently do not believe the film or other activities are germane to the issue of authenticity, since they only mention Marx's presence at the scene but not his subsequent cinematic exploits. Similarly, talk of mineshafts or freezer burn is also absent. It is arguable whether full disclosure is called for—after all, if the footprints are genuine, then the collateral activities are irrelevant. The argument for authenticity, however, is based primarily on the assumption that a hoax is implausible on the merits of the tracks alone. Once an alternative scenario for hoaxing is identified, the issue of motivation appropriately comes to the fore.

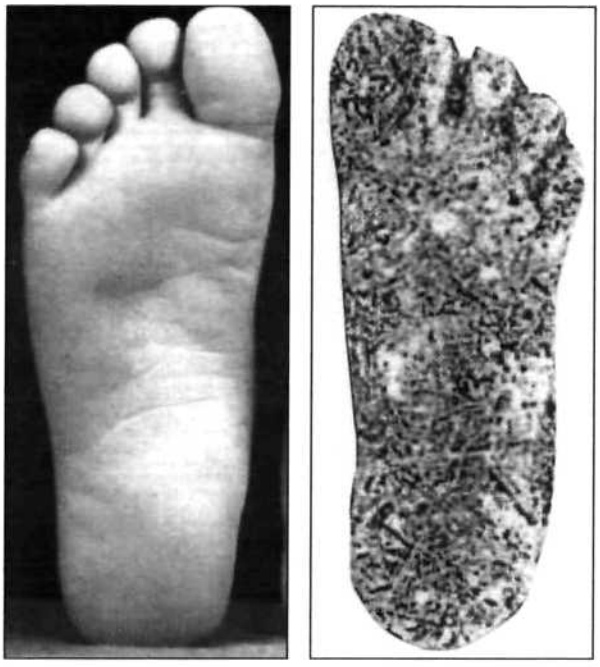

Figure 4. The foot of a ten-year-old compared to the "normal" Bossburg track, not to scale. Enlargement of the juvenile foot results in a shape remarkably reminiscent of these Bigfoot tracks. The argument that the Bossburg tracks could not have been faked entails the questionable assumption that a hoaxer could not have fabricated a scaled-up model of a child's footprints. Left image from Fripp and Shaw (1967), right image is from a photo in Rene Dahinden's collection.

Like the Patterson-Gimlin film, the Bossburg tracks occupy a central position in Bigfoot lore, their authenticity tied to the assumption of the impossibility of their fabrication. In the case of both pieces of evidence, the mere assertion that hoaxing can be ruled out is taken to be equivalent to a demonstration that this has, in fact, been established. For example, David Gordon (1992) argues for the authenticity of the Bossburg tracks by reasoning that it is "absurd" to suggest that anyone would think to fabricate deformed Sasquatch feet with anatomical accuracy. It is essentially the argument made by Krantz and Napier, in substance what Richard Dawkins (1986, 38) derides as the "argument from personal incredulity." When supporting arguments take this form, the search for Bigfoot becomes not so much a scientific enterprise but a subjective matter of personal conviction.

Notes

1. Napier's final verdict was this: "It is very difficult to conceive of a hoaxer so subtle, so knowledgeable—and so sick—who would deliberately fake a footprint of this nature. I suppose it is possible, but it is so unlikely that I am prepared to discount it" (1972, 122).

2. *Big Footprints*, pp. 43, 53. Boulder, Colorado: Johnson Books.

3. Meldrum (1999) offered a biomechanical and anatomical analysis of the prints in a presentation at the 1999 meetings of the American Association of Physical Anthropologists. Meldrum's diagnosis was reported by Grover Krantz (1999). In print, Meldrum has neither endorsed the authenticity of the tracks nor suggested that they are fabricated, but considers the tracks consistent with his model of the anatomy and function of Sasquatch feet.

4. A PubMed search of the primary literature revealed 229 published articles on clubfoot deformities from 1900 to 1969, which can be safely considered a conservative estimate of the number of papers dealing with the phenomenon. The number of articles with images or figures is not known. Textbooks having figures and radiographs of clubfoot deformities were also readily available in 1969. An exact count is difficult to come by, but publications dealing with foot pathologies began to appear with some regularity in the mid-nineteenth century, so the question of access to such material is not an issue.

5. The "unique" form of Sasquatch tracks is an oft-proposed argument for their authenticity. Fahrenbach (1998) offers a statistical analysis that suggests nonhuman foot proportions for the legendary Sasquatch.

6. Marx is a prolific photographer of Bigfoot, having filmed the beast on at least five occasions. Some of his more inspired work can be found on his video production *The Legend of Bigfoot* (1982, Palladium Pictures). *John Green's Sasquatch: The Apes Among Us* (1978) and Don Hunter's and Rene Dahinden's *Sasquatch/Bigfoot* (1973) offer independent accounts of what is known as the "Bossburg Incident." Peter Byrne is credited with uncovering several inconsistencies between the film itself and the narrative surrounding it.

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Pseudohistory in Jerry Vardaman's Magic Coins

The Nonsense of Micrographic Letters

An archaeologist claims to find hundreds of microscopic letters on ancient coins and inscriptions that completely rewrite history. Conclusion: bogus.

RICHARD C. CARRIER

Jerry Vardaman, an archaeologist at the Cobb Institute of Archaeology at Mississippi State University, claims to have discovered microscopic letters covering ancient coins and inscriptions conveying all sorts of strange data, which he then uses to assert the wildest chronology of ancient events imaginable, particularly for Jesus. For instance, these "microletters" allegedly prove that Jesus was born in 12 B.C. (instead of 6 A.D., which is the most credible year to date), Pontius Pilate actually governed Judaea between 15 and 26 A.D. (instead of 26–36 A.D.), Jesus was crucified in 21 A.D. (instead of in the 30s according to mainstream scholarship), etc. Vardaman's evidence is incredibly bizarre and can best be described as pseudohistorical.

Certainly, his "evidence" is not accepted by any other expert in ancient coins to my knowledge. It has never been presented in any peer-reviewed venue, and was totally unknown to members of the American Numismatic Society until I brought it to their attention. Several specialists there concurred with me that it was patently ridiculous. Nevertheless, Vardaman's conclusions keep turning up matter-of-factly in more mainstream sources, so an investigation is warranted.

That Vardaman has had this theory at least since 1989 and yet has never published it in any peer-reviewed journal demonstrates that Vardaman either realizes he cannot convince any real experts on the subject, or was told so by independent reviewers.

Vardaman's chronological arguments, and the use of his pseudo-evidence, appear in print in only three publications. The first, Vardaman's "Jesus' Life: A New Chronology," appears in Jerry Vardaman and Edwin Yamauchi, eds., *Chronos, Kairos, Christos: Nativity and Chronological Studies Presented to Jack Finegan*, published in 1989 by the small biblical studies press Eisenbrauns of Winona Lake, Indiana. The second is Vardaman's own *Chronology and Early Church History in the New Testament*, a series of typed and photocopied lectures delivered to the Hong Kong Baptist Theological Seminary in 1998. Only a few cheaply bound copies of this exist. Though I am based in New York City, I had to acquire mine on loan from the Southern Baptist Theological Seminary of Kentucky. The third item is in *Chronos, Kairos, Christos II: Chronological, Nativity, and Religious Studies in Memory of Ray Summers*, edited solely by Vardaman and published by Mercer University Press of Macon, Georgia, in 1998. In this, the evidence is not argued at all, but is simply taken for granted. This is true of Vardaman's "A Provisional Chronology of the New Testament: Jesus Through Paul's Early Years" (313–320)—which doesn't even mention the evidence on which the chronology is based—and of a chapter contributed by Robert Smith, "New Evidence Regarding Early Christian Chronology: A Reconsideration" (133–139), who takes all of Vardaman's claims about microletters for granted, based solely on his drawings.

Nevertheless, Vardaman's "conclusions" are cited without a single sign of skepticism by several people, including John McRay, who says in his 1991 book *Archaeology and the New Testament*, "Jerry Vardaman has discovered the name of Quirinius on a coin in micrographic letters, placing him as proconsul of Syria and Cilicia from 11 B.C. until after the death of Herod" (154). McRay cites a manuscript Vardaman sent him, which has never been published, though a similar claim appears in one of Vardaman's lectures delivered in China in 1998. That Vardaman has had this theory at least since McRay wrote in 1989 and yet has never published it in any peer-reviewed journal (but instead made a significantly different claim in an isolated foreign seminary lecture eight years later) demonstrates that Vardaman either realizes he cannot convince any real experts on the subject, or was told so by independent reviewers.

Vardaman's Microletters

I am not surprised. For what Vardaman means by "micrographic letters" (he usually calls them "microletters") are tiny letters so small that they cannot be seen or made without a magnifying glass and could only have been written with some sort of special diamond-tipped inscribers. He finds enormous amounts of this writing on various coins, supporting countless theses of his. He also claims that he and Oxford scholar Nikos Kokkinos discovered microletters on coins in 1984 at the British Museum, though Kokkinos has not published anything on the matter. Nevertheless, Vardaman tells us that some coins "are literally covered with microletters . . . through the Hellenistic and Roman periods" and that "whatever their original purpose(s), the use of microletters was spread over so many civilizations for so many centuries that their presence cannot be denied or ignored" (1989, 66–67). Such confident assertions for an extremely radical and controversial theory that has not been proven to the satisfaction of anyone else in the field gives the impression of a serious loss of objectivity.

Vardaman cites one authority in support of his thesis that does not in fact support him, yet he fails to qualify this citation for readers but acts as if this makes his theory mainstream. He refers to "hand-scratched microletters" noted by E. T. Newell in volume 46 of the *American Journal of Numismatics* (1912, 112), yet Newell only shows evidence there of graffiti on coins: one or two letters, roughly scratched by hand with an ordinary object, and quite visible to the naked eye. This phenomenon is in fact well known and not unusual. But these are not "microletters" in Vardaman's sense: they are neither microscopic nor do they literally cover coins with added information, but only a few letters at most. Moreover, their date cannot really be established, since the scratchings could have been made decades after the coins were minted. In contrast, central to Vardaman's thesis is the claim that most of these inscriptions were created by the minters and thus reflect official records.

Needless to say, this is totally unattested as a practice in any ancient source and none of the relevant tools (magnifying glasses and diamond microcutters) have been recovered, or ever heard of from ancient times. But there are even more concrete reasons to regard Vardaman's theory as crackpot. First, it is extremely rare to find any specimen of ancient coin that is not heavily worn from use and the passage of literally thousands of years, in which time the loss of surface from abrasion and

Richard Carrier is a doctoral candidate in ancient history at Columbia University, specializing in the history of Greco-Roman science and religion. He is also the editor-in-chief of the Secular Web (www.infidels.org). He can be reached at rcarrier@infidels.org.

oxidation is inevitable and significant. Even if such microscopic lettering were added to these coins as Vardaman says, hardly any of it could have survived or remained legible. Yet Vardaman has no trouble finding hundreds of perfectly legible words on every coin he examines. Second, to prove his thesis, Vardaman would at the very least be expected to publish enlarged photographs of the reputed microscopic etchings. Yet he has never done this. Instead, all he offers are his own drawings. Both of these facts are *extremely suspicious. Finally,* the sorts of things Vardaman finds are profoundly absurd, and rank right up there with Erich von Däniken's *Chariots of the Gods.* Figure 1 is a typical example.

Figure 1. "Microletters" on a Roman coin as seen by Jerry Vardaman.

Notice that this is merely a drawing, not a photograph, and that Vardaman gives no indication of scale (1989, 70–71, shown above in reversed order, and reduced). He never even properly identifies the coin type, and though he quotes the British Museum catalogue regarding it, he gives no catalogue number or citation, so readers are unable to hunt down a photograph of it or to estimate its size. I eventually found it on my own, in A. M. Burnett's 1992 catalogue of *Roman Provincial Coinage,* where it is listed as item 4797. There we discover that it is only 26mm in diameter. Yet his drawing has a diameter of 4.75 inches (about 120mm) for a scale of well over 4:1, and his blow-up (left) is a little over three times that, for at least 14:1. That means that his letters, drawn at around a quarter inch in size (around 6mm), represent marks on the original coin smaller than 1/50th an inch, less than half a millimeter. It would be nearly impossible to have made these marks, much less hundreds of them, and on thousands coins, at minting or afterward. Indeed, even the number of men and hours this would require would be vast beyond reckoning, considering the thousands of coins minted yearly, though Vardaman insists most of the marks were made in the dies from which the coins were cast (1989, 67), which entails a quality of die casting all but unimaginable for the ancient world. And though it would be entirely impossible for these marks to have survived the wear of time, Vardaman sees them clear as day (see figure 2).

Figure 2. A photograph of the coin in figure 1, with no microletters visible.

When we look at an actual photograph of this coin (here shown enlarged—Vardaman's drawings reproduce the coin's reverse, shown bottom), we see at once that Vardaman's claims are hopelessly untenable. To begin with, his representation of this coin is very misleading: his drawing includes all sorts of crisp details that imply a coin in a near-flawless condition, like the facial features of the goddess and veins in the laurel leaves along the bottom left edge (nearest the blow-up section), yet these are entirely a product of his imagination. It is quite clear that the coin has been worn so smooth that the face of the goddess is completely rubbed away, and the laurel leaves themselves have almost been obliterated—there are certainly no remaining details like the veins. We can also see that this wear has rubbed smooth the very region in which Vardaman finds the most microletters: there is nothing there. Even had there been something, it could not possibly have survived the wear endured by more robust features like the face and leaves. If Vardaman is reading anything, it can only be random scratches and pits, the byproduct of two thousand years of abrasion and oxidation.

There are even more fatal flaws here. Just as Vardaman says, this coin was minted by the city of Damascus in the reign of Tiberius, and the coin itself bears the legend "Λ ΗΚΤ ΔΑΜΑΣΚΩΝ" or "Year 328 of the Damascenes," referring to its re-establishment as a Greek city by the first Seleucus, in the last years of the fourth century B.C. Coins minted in Eastern Greek cities did not use Latin letters or words, they used Greek—one can see even from Vardaman's drawing that the *real* letters on this coin are Greek, spelling Greek words—yet almost all of Vardaman's "microletters" for some strange reason appear in Latin. Second, and quite humorously, all the Latin letters for "J" appear, as Vardaman reproduces them, as modern J's, yet that letter was not invented until late in the Middle Ages. If his J's were genuine, they should appear as the letter I. This alone proves his claims are bogus.

But Vardaman doesn't stop there. The microletters tell him all sorts of new "facts" about the ancient world. Most bizarre of all:

The most important references on this coin are to "Jesus of

Continued on page 61

Are Science and Religion Compatible?

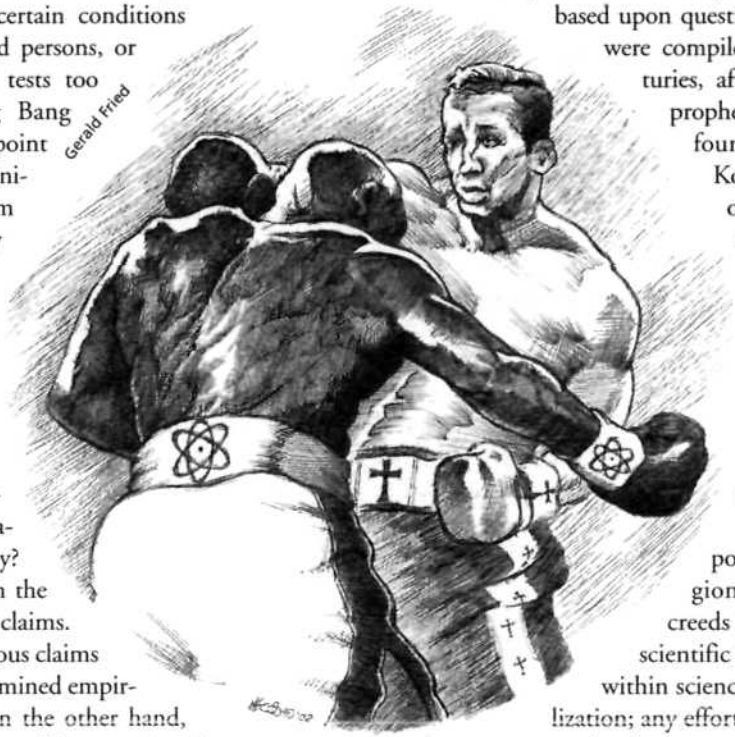
We need separations between religion and science, ethics, and the state. But there is an appropriate domain for religion, and in this sense science and religion are not necessarily incompatible. That domain is evocative, expressive, emotive. Religion presents moral poetry, aesthetic inspiration, and dramatic expressions of existential hope and yearnings.

PAUL KURTZ

There have been many conferences recently discussing the relationship between science and religion. The Templeton Foundation, for example, has supported numerous conferences on this theme. Many of those participating in these discussions apparently assume that science and religion are compatible. They argue that there is no contradiction between them, and some even maintain that science confirms the basic principles of religious faith. I suspect that most of the participants of this conference, made up predominantly of skeptics and nontheists, do not agree.

There are many areas where religionists and scientists make radically different truth claims. Some of them are: (1) Does the soul or consciousness exist, as a separate and

distinct entity; or is it a function of the brain? (2) Does science provide evidence for "intelligent design," or does evolutionary biology suffice without it? (3) Is it possible to influence the healing of persons by praying for them at a distance, or are the tests performed completely unreliable? (4) Is there empirical evidence for the claim that "near-death experiences" enable us to reach "the other side," or are there alternative physiological and psychological explanations for these experiences? (5) Can mediums under certain conditions communicate with deceased persons, or are the protocols of such tests too loose? (6) Does the Big Bang hypothesis in astronomy point to God as the cause of the universe, or is the latter claim beyond science and purely speculative?



In dealing with the above topics various questions emerge: Are coherent theories and testable hypotheses presented? If so, what is the evidence for them? Do paranormal-spiritual-religious explanations survive critical scrutiny?

Skeptics have focused on the examination of paranormal claims. They do not deal with religious claims *per se*, unless they can be examined empirically. Secular humanists, on the other hand, do wish to deal with religious claims, testing them as best they can. Interestingly, in recent years the borderlines between the paranormal and religion have blurred and it is often difficult to tell when we are dealing with paranormal or religious phenomena. Thus spiritualism, near-death experiences, and communication with dead people interest both paranormal and religious investigators. Similarly for the appeal to intelligent design—a classical philosophical argument—now introduced within evolutionary biology and cosmology.

I have proposed that we use the term *paranatural* to refer to religious claims that are capable of some empirical resolution and are not transcendental or supernatural. In this sense they are similar to testable paranormal claims.

A good example of the overlap is in the popular belief that mysterious intelligent and beneficent extraterrestrial beings are visiting earthlings and floating them aboard spaceships. This is a quasi-religious phenomenon reminiscent of angels, and other divine or semi-divine beings of earlier ages. The disappearance of the Roswell aliens is not unlike the empty tomb of the New Testament!

In order to analyze the relationship between science and religion, we need to define and characterize each domain. Many consider that religion offers a special kind of higher spiritual truth. They maintain that there are *two* truths: (1) the truths of science, employing the methods of scientific inquiry, and testing claims empirically, rationally, and experimentally; and (2) the truths of religion, which transcend the categories of empirical fact and logic. Skeptics are rightly dubious of this latter claim.

The most reliable methods, they insist, are those that satisfy the objective standards of verification and justification. The historic claims of revelation in the ancient sacred texts are insufficiently corroborated by reliable eyewitnesses or are based upon questionable oral traditions. These were compiled many decades, even centuries, after the alleged death of the prophets. Many miraculous claims found in the Bible and the Koran—for example, the claims of healings and exorcisms, within the New Testament or the creationist account in the Old Testament—are unreliable. They express the primitive science of an ancient nomadic and agricultural people, and do not withstand contemporary scientific scrutiny.

Unfortunately, some proponents of the historic religions have often used their creeds in order to block or censor scientific inquiry. Freedom of inquiry within science is essential for human civilization; any effort to limit scientific research is counterproductive.

A good illustration of this is the present effort of some to restrict embryonic stem-cell research on moral or religious grounds. It is argued that if a cell begins to divide, even if only six or eight cells, that a "soul" of a person is already implanted, and that any effort to experiment with this is "immoral." The postulation of a soul to prohibit scientific inquiry is reminiscent of the suppression of Galileo and the teaching of Darwinism. Thus insofar as religion claims to provide some overall imprimatur for scientific research we need *a separation of religion and science.*

A second area concerns the relationship between science and morality. I raise this question here because many people think that the main function of religion is moral. Stephen Jay Gould in the SKEPTICAL INQUIRER talked about two magisteria, science and religion, which he says do not compete and do not contradict each other.[1] The domain of science, deals with truth, he says, that of religion with ethics. I think that this position is mistaken. Indeed I would argue that there also ought to be *a separation between ethics and religion.* Religionists have

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Paul Kurtz is Chairman of the Center for Inquiry and Professor of Philosophy Emeritus, State University of New York at Buffalo. *This paper introduced the Center for Inquiry conference "Science and Religion: Are They Compatible?" Nov. 9–11, 2001, in Atlanta.*

no special competence in framing moral judgments. I say this because a great effort has been expended in the history of ethics—from Aristotle to Spinoza, Kant, John Stuart Mill, and John Dewey—to demonstrate that ethics can be autonomous and that it is possible to frame ethical judgments on the basis of rational inquiry. There is a logic of judgments of practice, rules of effective decision-making, and ethical knowledge that we can develop quite independently of a religious framework. Science has a role to play here, for it can expand the means at our disposal (technology), and it can modify value judgments in the light of the facts of the case and their consequences. Many people today mistakenly believe that you cannot be moral without religious foundations. Ever since the Renaissance, the secularization of morality has continued quite independently of religious commandments.

Skeptics have focused on the examination of paranormal claims. They do not deal with religious claims *per se*, unless they can be examined empirically. . . .Thus spiritualism, near-death experiences, and communication with dead people interest both paranormal and religious investigators.

A third area which has been hotly debated in the modern world is the relationship between religion and the state. Most democrats today defend the separation of religion and the state; they say that, though religionists have every right to express their point of view in the public square, religion should be primarily a private matter. Religions should not seek to impose their fundamental moral principles on the entire society. Democratic states should be neutral about professing religious principles.

What then is the proper domain of religion? Is anything left to religion? My answer is in the affirmative. This may surprise skeptics, but I think that religion and science are compatible, depending of course on what is meant by religion. Religion has performed an important function that cannot be simply dismissed. Religions will continue with us in the foreseeable future and will not easily wither away. No doubt my thesis is controversial: religious language, I submit, is not primarily descriptive; nor is it prescriptive. The descriptive and explanatory functions of language are within the domain of science; the prescriptive and normative are the function of ethics. Both of these domains, science and ethics, have a kind of autonomy. Certainly within the political domain, religionists do not have any special competence, similarly for the moral domain. It should be left to every citizen of a democracy to express his or her political views. Likewise, for the developing moral personality who is able to render moral judgments.

If this is the case, what is appropriate for the religious realm? The domain of the religious, I submit, is evocative, expressive, emotive. It presents moral poetry, æsthetic inspiration, performative ceremonial rituals, which act out and dramatize the human condition and human interests, and seek to slake the thirst for meaning and purpose. Religions—at least the religions of revelation—deal in parables, narratives metaphors, stories, myths; and they frame the divine in human (anthropomorphic) form. They express the existential yearnings of individuals endeavoring to cope with the world that they encounter and find meaning in the face of death. Religious language in this sense is eschatological. Its primary function is to express *hope*. If science gives us truth, morality the good and the right, and politics justice, religion is the realm of promise and expectation. Its main function is to overcome despair and hopelessness in response to human tragedy, adversity and conflict, the brute, inexplicable, contingent and fragile facts of the human condition. Under this interpretation religions are not primarily true, nor are they primarily good or right, or even just; they are, if you will, *evocative*, attempting to transcend contrition, fear, anxiety, and remorse, providing balm for the aching heart—at least for many people, if not all.

I would add to this the fact that religious systems of belief, thought, emotion, and attitude are products of the creative human imagination. They traffic in fantasy and fiction, taking the promises of long-forgotten historical figures and endowing them with eternal cosmic significance.

The role of creative imagination, fantasy, and fiction, should not be dismissed. These are among the most powerful expressions of human dreams and hopes, ideals and longings. Who could have imagined that J.K. Rowlings's *Harry Potter* series of fictionalized books or J.R.R. Tolkien's *Lord of the Rings* would so entrance young people, or that so many humans would be so fascinated by fictionalized novels, movies, and plays. The creative religious imagination weaves tales of consolation and of expectation. They are dramatic expressions of human longing, enabling humans to overcome grief and depression.

In the above interpretation of religion as dramatic existentialist poetry, science and religion are not necessarily incompatible, for they address different human interests and needs.

A special challenge to naturalism emerges at this point. I think that most of us might agree that *methodological naturalism* is the basic epistemological principle of the sciences; namely, that we should seek natural causal explanations for phenomena, testing these by the methods of science. *Scientific naturalism*, on the other hand, goes beyond this, because it rejects as nonevidential the postulation of occult metaphors, the invoking of divine forces, spirits, ghosts, or souls to explain the universe; and it tries to deal in materialistic, physical-chemical, or non-reductive naturalistic explanations. The frenzied opposition to Darwinism today is clearly based upon fear that scientific naturalism will undermine religious faith.

If this is the case, the great challenge to scientific naturalism is not in the area of truth but of hope, not of the good but of promise, not of the just but of expectation—in the light of the tragic character of the human condition. This is in stark contrast with the findings of neo-Darwinism, which recognizes that death is final, not simply the death of each individual but the possible extinction some day in the remote future of the human species itself. Evolutionists have discovered that millions of species have become extinct. Does not the same fate await the human species? Cosmological scientists indicate that at some point it seems likely that our Sun will cool down, indeed, looking into the future, that a Big Crunch may overtake the entire universe. Others talk about a deep freeze. Some star trekkers are inspired by science fiction. They say that one day perhaps we will leave Earth, inhabit other planets and galaxies. Nonetheless at some point the death not only of the individual, but of our species, our planet and solar system seems likely.

What does this portend for the ultimate human condition? We live in an epoch where the dimensions of the universe have expanded enormously on the micro and on the macro level. We are talking about billions of light years in dimension. Much of this is based on speculative extrapolation. Nonetheless, we can ask, Does the naturalistic picture crush human aspiration? Does it destroy and undermine hope? Does it provide sufficient consolation for the human spirit? From this perspective, the central issue for humans is the question of human *courage*. Can we live a full life in the face of ultimate human extinction? These are large-scale questions, yet they are central for the religious consciousness. Can scientific naturalism, insofar as it undermines theism, provide an alternative dramatic, poetic rendering of the human condition, offering hope, and promise? Countless numbers of brave individuals can live significant lives and even thrive accepting the possible far death of the species and our solar system. But so many other humans—perhaps the bulk of humankind—cannot bear that thought. They crave immortality, and religion satisfies their need. Many others do not stay awake nights worrying what will happen five, ten, or fifteen billion years from now. They find life worthwhile for its own sake here and now.

I think that religion and science are compatible, depending of course on what is meant by *religion*. Religion has performed an important function that cannot be simply dismissed.

In conclusion, let me say that we are living through a period of exacerbated religiosity in the United States. There seems to be a new spiritual paradigm emerging, contesting both scientific and methodological naturalism. The United States is an anomaly in this regard, especially in contrast with the decline of religious belief in Europe. Recent scientific polls of belief in European countries—France, Germany, England, and others, even Japan—indicate that the level of belief in a theistic being and the institutionalized practice of organized religion have declined considerably; yet these highly secular societies exemplify good moral behavior, and are far less violent than the United States. The view that without religion you cannot have a meaningful life or high motivation is thus thrown into question. We should not take the current religious bias regnant in America today as necessarily universal for all cultures.

Note

1. Gould, Stephen J. 1999. "Non-Overlapping Magisteria." SKEPTICAL INQUIRER July/August 23(4). □

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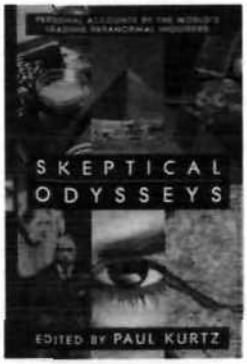

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The Emptiness of Holism

An old psychological controversy concerning the relative merits of clinical and statistical prediction has direct implications for modern-day beliefs in "holism." The notion that one should not consider individual factors, but rather a complex whole, is frustratingly vague and incompatible with all that we have learned about human cognitive limitations and judgmental biases. Despite its seeming compassion, the mantra of holism may constitute empty rhetoric that shields its proponents from the hard work of discovering, assessing, and validly integrating meaningful information.

JOHN RUSCIO

A half-century ago, psychologists were embroiled in a debate over the utility of unaided human judgment for combining available information to reach important decisions. In what remains the definitive treatise on this subject, Meehl (1954) argued that there is no theoretical or empirical reason to suspect that we can combine information in our heads as effectively as we can by using a simple statistical or actuarial procedure. Over the past fifty years, research on clinical judgment has consistently shown that Meehl was correct (e.g., Dawes, Faust, and Meehl 1989; Grove, Zald, Lebow, Snitz, and Nelson 2000). This research has direct bearing on modern beliefs in "holism," the proposition that practitioners should consider not individual pieces

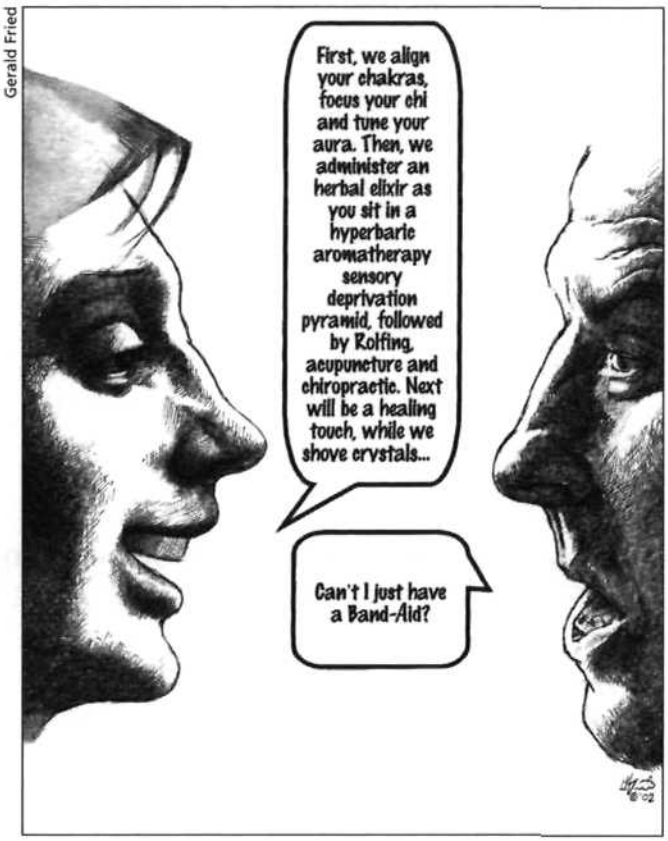
of information, but a complex whole.

Holism has achieved a considerable following among some health care professions (we now have self-styled holistic healers, holistic veterinarians, holistic nurses, and others) and believers in paranormal phenomena (witness modern astrology's insistence on the use of the "whole chart") despite a highly questionable rationale and virtually no empirical support. Proponents of holism espouse vague, ill-defined practices that require psychologically impossible feats of judgment. In this sense, holism provides a façade of compassion behind which the idiosyncratic, free-for-all approaches of its practitioners are shielded from skeptical scrutiny.

Vague Retreats from Reality

Holists disparage scientific theory and method through the use of painfully ambiguous language that intentionally discards valuable information. Gilovich (1991, 125) quotes Roger Lambert, a character in John Updike's *Roger's Version*, who notes, "Next to the indeterminacy principle, I have learned in recent years to loathe most the term 'holistic,' a meaningless signifier empowering the muddle of all the useful distinctions human thought has labored at for two thousand years." This weakness can be demonstrated through a clear case with obvious consequences. If you broke your leg, would you prefer (a) to have a doctor put it in a cast and give you crutches; or (b) to have a holistic healer, rather than dealing specifically with your leg, treat you as a "whole person" by prescribing some mixture of acupuncture, herbs, homeopathy, magnets, nutritional supplements, reflexology, therapeutic touch, and/or other alleged remedies? In other words, should a broken leg be treated directly or be considered a broader problem in need of a broader remedy? It seems likely that even the most staunch advocate of holistic medicine, upon breaking his or her leg, would want a cast and some crutches.

For many, this logic becomes more murky when thinking about less directly observable events. But why should it? When your car breaks down, do you want a mechanic to assess and repair the specific mechanical failure or to holistically repair the "whole car?" If this choice seems clear enough to you, you might be surprised by an analogy on the American Holistic Veterinary Medical Association's (AHVMA) Web site. Here, a common (though grotesque) distortion of the car-repair analogy is used to help promote the full range of "holistic healing" practices for pets. Although the AHVMA formally endorses evidence-based treatments, it simultaneously perpetuates a continual and only thinly veiled assault on science. After noting that "conventional" treatments "are employed simply to make the symptoms go away," it presents the following false analogy which reveals its hostility to science: "Picture a car with a low oil warning light. Extinguishing the light will certainly make the sign go away, but will it solve the problem?" The clear implication is that scientists, and unenlightened veterinarians, are so unfathomably inept that they would "extinguish the light" in some way *other* than adding oil! In reality, this scenario misrepresents the source of disagreement between the scientific and holistic approaches: What should be done to


Gerald Fried
First, we align your chakras, focus your chi and tune your aura. Then, we administer an herbal elixir as you sit in a hyperbaric aromatherapy sensory deprivation pyramid, followed by Rolfing, acupuncture and chiropractic. Next will be a healing touch, while we shove crystals...
Can't I just have a Band-Aid?

address a specific problem? In this example, the "whole car" is not broken—so what, one might ask, would a holistic auto mechanic do? The holistic vets are silent on that point. Thus, even the example chosen to disparage science shows that it undoubtedly involves the smartest course of action: to validly detect the *specific* problem (low oil) and treat it in a *targeted manner* (add oil). By contrast, holism is empty rhetoric.

Consider an additional example that is not hypothetical, but drawn from the beliefs of modern astrologers (see Kelly 1997) that they must make use of the "whole chart" to render professional judgments. Astrology is based on the belief that all natural phenomena are influenced by celestial bodies, and there is partial truth to this: "Every time we wake up with the sun, or plan barbecues on moonlit nights, or go fishing at high tide, we are showing how celestial bodies have real influence in our lives" (Kelly 1997, 1035). But these influences are far more trivial than the grand claims of astrology suggest. For centuries, astrologers were consulted for assistance in making important, practical decisions: Should I marry this person? Should I wage war against this nation? Around the 1950s, however, science began to catch up with astrology and test the predictions that astrologers made. These tests revealed that astrologers were unable to make predictions any better than chance-level guessing (for reviews, see

John Ruscio is in the Department of Psychology at Elizabethtown College, One Alpha Drive, Elizabethtown, PA, 17022-2298. He is the author of the Clear Thinking with Psychology: Separating Sense from Nonsense, *published in 2002 by Wadsworth. E-mail: rusciojp@etown.edu.*

Dean, Mather, and Kelly 1996; Kelly 1997, 1998).

In the face of overwhelming negative evidence, astrologers faced a tough choice: either reject their discredited beliefs or create post-hoc explanations. In true pseudoscientific form, astrologers embraced a range of evasive tactics, including holism. Thus, modern astrology pays little attention to the evidence against it because "the horoscope is a whole system in which every part is influenced by every other part" (Kelly 1997, 1044). That is, because they have tested only one astrological factor at a time, failing to take into account the "whole chart" that professional astrologers supposedly utilize to make their predictions, scientific investigations are viewed by astrologers as invalid tests of their trade.

Through the use of evasive language, holists sidestep the burden of determining what information is relevant and following a justifiable procedure for assessing and integrating this information.

In astrology—as in all other empirical matters—this holism defense is fatally flawed. One can rightly ask just what "the whole chart" means:

> Where does the whole chart end? With ten planets [astrologers count the Sun and our Moon, though none of the dozens of other moons in our solar system, as planets], twelve signs, twelve houses, midpoints, Arabic points, nodes, aspects and whatever other astrological concepts may be used, it is simply impossible to interpret a "whole chart." When astrologers claim that they use the whole chart, they only refer to the fact that they use more factors than just one. Nevertheless, no matter how many factors they use, they always use a restricted number of factors, and therefore only a part of the horoscope. They never use the whole chart. But then the question becomes how many factors would be considered, and which factors?...Suppose that I consider as many as 20 factors, then undoubtedly an astrologer will come up who claims that I should use 21 factors. (Van Rooij 1994, 56)

Thus, the "whole chart" is just as much a convenient fiction as the "whole person" or the "whole car." Through the use of evasive language, holists sidestep the burden of determining what information is relevant and following a justifiable procedure for assessing and integrating this information to reach a decision.

Lessons From Research on Clinical Judgment

The study of clinical judgment bears directly on this point. Like holism, the clinical approach to prediction is associated with a desire for narrative truth (a plausible "good story" involving causal explanations) as opposed to historical truth (a factually correct account involving probabilistic explanations; Dawes 1994). The accuracy of judgments made in a methodical way from just a few relevant pieces of information is equal or superior to that of judgments made by experts who combine a wide array of information in an intuitive manner (for a review, see Dawes, Faust, and Meehl 1989). Findings clearly and consistently indicate that a probabilistic relationship is more readily obtained and verified than a causal understanding and that historical truth is more useful than narrative truth:

> There is no controversy in social science that shows such a large body of qualitatively diverse studies coming out so uniformly in the same direction as this one. When you are pushing 90 investigations, predicting everything from the outcome of football games to the diagnosis of liver disease and when you can hardly come up with a half dozen studies showing even a weak tendency in favor of the clinician, it is time to draw a practical conclusion (Meehl 1986, 374).

This superiority of statistical over clinical prediction has been attributed to two complementary sources: the desirable mathematical properties of statistical techniques, which are extremely effective tools for detecting relationships amidst considerable variation, and the cognitive limitations and biases of unaided human judgment. For example, because our memory and processing capabilities are limited, our judgment often relies heavily on mental shortcuts—or "heuristics" (Kahneman, Slovic, and Tversky 1982)—such as availability (the easier we can recall or imagine instances of an event, the more common we judge it to be; Ruscio 2000a) or representativeness ("like goes with like"; Gilovich and Savitsky 1996) that can lead to misjudged probabilities or frequencies and the creation of superstitious beliefs. We are also strongly biased in favor of our prior beliefs and are adept at constructing post-hoc explanations (Ruscio 1998) that sacrifice historical truth for narrative truth. All of these biases, as well as many others (e.g., Kahneman, Slovic, and Tversky 1982; Nisbett and Ross 1980; Ruscio 2002), contribute to our faulty use of information relative to valid statistical formulas.

The evidence suggests that unaided human judgment cannot compete with a more mechanical process that involves a comparatively simple combination of a small handful of relevant variables. This conclusion has been supported in a tremendous number of disciplines, and includes all of the following decisions made by trained and experienced professionals (Dawes, Faust, and Meehl 1993):

- differential diagnoses of medical conditions
- predictions of the longevity of chronically ill patients
- predictions of success that lead to the acceptance or rejection of applicants to colleges, graduate programs, or jobs
- predictions of dangerousness in parole hearings
- predictions of the outcomes of sporting events used to set gambling odds
- predictions underlying financial transactions such as lending money and issuing insurance policies

When provided with identical information, statistical procedures achieve greater empirical accuracy than do professionals. This remains true when one provides professionals with information not available to the statistical procedure, and even when one provides the results of the statistical procedure itself, in which case professionals identify too many "exceptions" to the rule (Dawes, Faust, and Meehl 1989).

For half a century, there has been a concerted research effort

to find even a single domain in which clinical judgment fares as well as statistical decision making. It seems highly unlikely that holists are the heretofore undiscovered exception to this rule. I challenge holists to put their judgments to the test in a fair competition with a simple, mechanical decision-making procedure.

Psychological Impossibilities

Holists fail to confront psychological realities. Like all other adherents to the clinical approach to prediction, holists overestimate the extent to which people can validly combine information in their heads. Holists assert that they can "take into account" a vast array of information in a complex, configural manner, ignoring the cognitive limitations of all humans.

As noted in the previous section, empirical studies have clearly established the superiority of simple mechanical combinations of data over clinical judgment. The evidence is also robust in another sense: Several different types of "mere" linear equations routinely outpredict human judges. That is, not only are equations that optimally weight information superior to clinical judgment, but so are equations that preserve only the direction of relationships—positive or negative—and weight the predictors equally (Dawes 1979). Moreover, research shows that judgments are more accurate when made from a highly limited number of valid predictors; extra information that *could* be ignored typically is not, which serves to dilute the quality of judgments (Ruscio 2000b). The demonstrated superiority of "unit-weighted" models over judges prompted Dawes and Corrigan (1974) to conclude that "the whole trick is to know what variables to look at and then to know how to add" (105). Unfortunately, holists refuse to narrow their attention to any particular variables, believing as they do that "everything influences everything else." They also insist that a far more complex process than mere addition is necessary to understand the "whole person" or "whole chart," despite overwhelming evidence to the contrary.

Just as the predictive failure of individual factors within the horoscope forced astrologers to retreat to the safer, more vague ground of holism, early research on the clinical-statistical prediction controversy led many people to speculate that clinical judgment would prevail at a more complex task. Unaided human judgment was acknowledged to be inferior to a linear equation when making simple decisions, but was hypothesized to be superior when the information itself was interrelated in complex ways. As in the context of holism, it was proposed that task characteristics such as configural relationships between variables—curvilinear cue-criterion relationships or cue interactions—might favor the highly trained and experienced practitioner (Meehl 1954, 1967).

Research, however, has failed to reveal the so-called "configural judge" (Goldberg 1991). This result makes intuitive sense. It is futile to presume that, although clinical judgment is demonstrably poor at the relatively simple tasks that have been studied (e.g., making decisions based on a small number of valid predictors that are all linearly related to the outcome), it will function superbly with *more complex* tasks (e.g., making decisions based on a large number of variables, each of different and questionable validity, that are nonlinearly related to the outcome and that interact with one another to an unknown extent). If a mechanical process can eke out an advantage even with simple tasks, it will roundly best us with more complex tasks. In fact, research suggests that we are able to work effectively with up to about eight pieces of information at once (Cooksey 1996), and there is absolutely no evidence that we are capable of psychologically manipulating even this much information if it is interactive or nonlinear.

To put the final nail in this coffin, it turns out that configural judgment is seldom helpful anyway, because simpler approaches can be astonishingly potent. Dawes (1979) has argued that naturally occurring relationships between variables tend to be "monotonic." That is, the *direction* of a variable's effect does not typically change as it interacts with other variables. Nonlinear relationships tend to be monotonic, too. The significance of monotonicity is that simple linear models are able to capture interaction effects and nonlinear effects amazingly well.[1] Thus, the psychological impossibility of "taking into account" a wide range of interacting and nonlinear variables undermines a central tenet of holism, and the power of simple linear models suggests that holism itself represents a misdirected goal.

There is another psychological impossibility to consider. In their appeal to holism, practitioners claim to be able to work with an implausible number of unique configurations of information. For example, modern astrology makes a fundamentally absurd presumption regarding the number of unique horoscopes that exist. Based on a typical list of factors, Kelly (1997) calculates that there are approximately 10^{28} possible horoscopes. Without providing details for her calculations, one astrologer arrived at the figure of 5.39×10^{68} (Doane 1956). Either way, both values undermine the justification for holism because there are far more unique horoscopes than the number of people that have ever lived! Given this fanciful premise, it is quite likely that nearly every person ever born (excepting, perhaps, identical twins) has had a unique horoscope. Therefore, an astrologer will never have met, or even read about, another person with your unique horoscope. If nobody has ever had your unique horoscope before, how could astrologers know what to predict for your future? The individual factors in your chart are the only usable information (they *are* shared with other people), but holistic astrologers cannot use these to formulate predictions—they wouldn't be using the whole chart! The "everything influences everything else" nature of holism invariably leads to this crippling paradox.

Justification of a Free-For-All Approach to Practice

The emerging picture of holism is one of a scientist's curse and a charlatan's dream. Holists imply an ability to "take into account" all relevant factors, which they cannot, and shield their lack of knowledge or skills with linguistic evasions while steadfastly refusing to state, define, assess, or integrate any specific variables at all. Such a lack of standards or guidelines based on empirical support would be debilitating to a conscientious scientist-practitioner. There is a vicious double standard in that holists, who reject the very principles that inform ethically defensible practices, enjoy a freedom from the challenging

work of developing and validating a set of practice guidelines, learning and teaching these guidelines to others, and constraining their thinking in accordance with any defensible principles at all. This "anything goes" mentality is justified on the basis of each holist's personal beliefs, biases, and inclinations. Holists' strongly implied suggestions (as on the AHVMA Web site) that their practices provide individuals seeking professional advice with better results than can well-trained scientist-practitioners is nothing short of offensive. Moreover, despite overwhelming scientific evidence against the clinical approach to prediction that holists have pushed well past its breaking point, they demonstrate an untenable adherence to it.

Meehl (1986) attributes such irrational adherence to an inferior decision-making procedure to several sources. Many individuals' unwavering belief in the efficacy of their own judgment—the pervasive and pernicious overconfidence effect (Ruscio 1998)—or in the importance of their preferred theoretical identification (as contrasted with an atheoretical statistical procedure) is a potent stumbling block. Perhaps most destructive of all is the common complaint that the use of statistical decision making can feel "dehumanizing," that it somehow denies the uniqueness of individuals. This is simply untrue. In fact, research comparing clinical and statistical prediction has involved consideration of identical information; the only issue is how best to combine it. The importance of the "feel" of a procedure pales in significance when compared with a more ethically defensible benchmark for evaluating decisions: a demonstrable track record of empirical accuracy. Meehl (1986) puts it this way. "If I try to forecast something important about a college student, or a criminal, or a depressed patient by inefficient rather than efficient means, meanwhile charging this person or the taxpayer 10 times as much money as I would need to achieve greater predictive accuracy, that is not a sound ethical practice. That it feels better, warmer, and cuddlier to me as predictor is a shabby excuse indeed" (374).

Conclusions

Holism suffers from the serious shortcomings of the clinical approach to decision making. Unaided human judgment is simply incapable of dealing effectively with large amounts of complex information. Furthermore, there is an overstated need for configural judgment in the first place. A simple, mechanical combination of a handful of relevant variables is often sufficient to achieve the predictive power afforded by existing knowledge. Compounding the troubles of holism is its proponents' resolute refusal to offer reliable evidence that they use any consistent decision-making strategy at all. It is noteworthy that clinical judgment—let alone holistic verbiage—is rarely tolerated when large sums of money are at stake (e.g., decisions involving loans, insurance, or gambling odds). Holism is an empty retreat from reality, a method by which pseudoscientists muddy rational thought, avoid clear and concise communication, and follow their own idiosyncratic beliefs to justify doing whatever they please in the name of all that sounds nice and feels good.

Note

1. Here's a simple but dramatic example drawn from Yntema and Torgerson (1961). Consider three factors i, j, and k, such that each factor varies as a rectangular distribution along the integers from 1 to 7 and is completely independent of the other two factors. Within a data set of 343 cases ($7 \times 7 \times 7$), let's explore two questions. First, how well do you suppose a linear model based solely on the additive main effects of i, j, and k can predict a criterion composed purely of interactive relationships, $(i \times j) + (i \times k) + (j \times k)$? The multiple correlation coefficient is .97, which accounts for 94% of the variance! Second, how well do you suppose that a linear model of additive main effects can predict a criterion composed purely of nonlinear effects, $i^2 + j^2 + k^2$? The multiple correlation coefficient is .98, which accounts for 96% of the variance! Thus, given the incredible predictive power of linear models with monotonic relationships, configural judgment is neither necessary nor beneficial.

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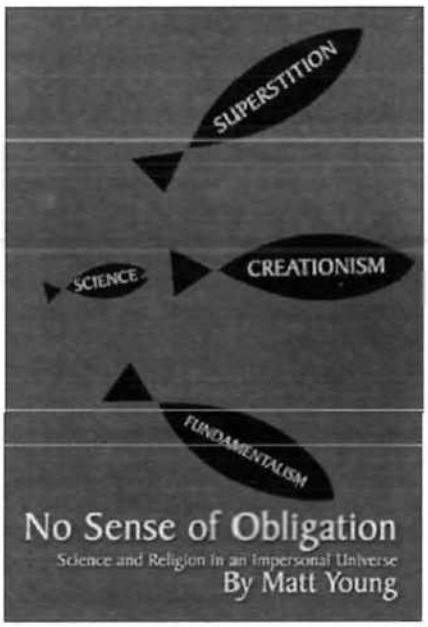
Laugh or Cry

HOWARD A. GARCIA

No Sense of Obligation: Science and Religion in an Impersonal Universe. By Matt Young. 1stBooks Library, 2511 W. 3rd St., Suite 1, Bloomington, IN 47404, 2001. ISBN 0-75961-089-4. 349 pp. Softcover, $21.79.

"I don't know whether to laugh or cry," wrote evolutionary biologist Stephen Jay Gould in a 1981 magazine article lamenting the emergence of a new, particularly virulent strain of resurgent creationism. The venue of his discomfiture was the courtroom of Federal Judge William Overton; the occasion was a hearing on the constitutionality of an Arkansas law mandating equal treatment of creation science *vis a vis* biologic evolution in the Arkansas school curriculum; and the cause was the need, once again, to explain that the 4.5-billion-year geologic record of Earth, evident in exposed sedimentary strata, was not the result of the "great flood," reckoned by biblical scholars to have occurred less than 10,000 years ago. This episode is by no means an isolated incident, but one of a long series of legal battles instigated by conservative religious factions intent upon subverting the American educational system to meet the strictures of their particular sectarian viewpoint.

But the broader issue goes far beyond the contentious argument between empirical science and religion concerning biologic evolution; it also involves the larger contest between science and anti-science that dates from the first time a human began to question supernaturally inspired traditional beliefs and began to trust his own intellect to interpret his physical environment using reason and experiment. There have always been two basic forms of anti-science: religion and non-theistic mysticism of one sort or another. Each is as old as history itself, and though similarly steeped in spirituality they have been more often antagonistic than allied. Religion adheres tenaciously to an ancient creed while



mysticism is protean, constantly seeking new metaphysical bases for good and evil, human destiny and the universe.

It is the misfortune in this war of ideas that few scientists care to engage in a fruitless argument with a sometimes clueless but fanatical adversary. To them such arguments are an extravagant waste of time. Long and painful experience has demonstrated that neither cogent argument nor evidence, gleaned from centuries of research, makes any impression on the mind of a fundamentalist or mystic. The scientists' energies are more profitably spent pursuing their own field of dedication. Among those few willing to accept the challenge, many are ill-prepared to debate in a totally unfamiliar arena—a society of closed minds. The result is usually a debacle for science.

The need has clearly arrived for a carefully reasoned exposition by a competent scientist, properly equipped to rebut anti-science forces on a thesis-by-thesis, case-by-case basis on anti-science's own turf, be it Old Testament arcania, creationism, astrology, postmodernist theory, etc. *No Sense of Obligation* is such a work. Matt Young is that scientist. (A physicist retired from the National Institute of Standards and Technology in Boulder, he is an adjunct professor of physics at the Colorado School of Mines. His article "Science and Religion in an Impersonal Universe" appeared in SKEPTICAL INQUIRER's Science and Religion 2001 issue, September/October 2001.) Young enters this arena as an eclectic scholar thoroughly acquainted with both sides of each issue, first developing the argument from the other side's

Howard A. Garcia is a solar physicist working at the Space Environment Center, National Oceanic and Atmospheric Administration, Boulder, Colorado.

perspective—before blowing it out of the water, exposing its inconsistencies, unfounded assumptions, distortions and pure inventions.

Young states his objective with blunt and crystal clarity before the short first chapter is concluded: "I will examine the case for the existence of God." Then, "This book has two purposes: First to convince you, if necessary, that the only truly reliable knowledge is knowledge that is based on careful observation, reasoning, and experimentation. . . . My second objective will be to apply scientific method to the hypothesis that the universe is governed by a creator."

In a nutshell that is what the book is about, but the path is strewn with pedagogic gems. To begin we learn what the scientific method means and how it differs from the theologic method: "Scientists do not choose a hypothesis and assume that it is true; rather they seek the best among competing hypotheses. Religion draws its conclusion first and then sets about to prove that conclusion rather than to examine it objectively." This theme recurs several times in different guises in the book.

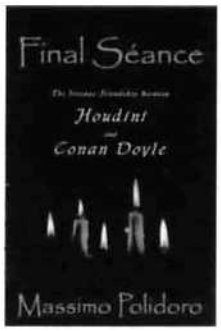
The chapter "Science, Evidence and Nonsense" introduces an idea perhaps foreign to most nonscientists: the principle of falsifiability. This idea goes to the very heart of science and is the main firewall between science and anti-science: any hypothesis must be subject to be proven wrong. Any hypothesis that fails this test is not scientific; moreover, failing this test renders its conclusions suspect. It also leaves the impression that putative evidence that reverts back to the unfalsifiable original hypothesis cannot be trusted, i.e., a circular argument. Evidence in support of a hypothesis must be obtained independently of the hypothesis.

"Signs, Wonders and Anecdotes" deals with the nearly insuperable task of winning an argument using logic, citing evidence, following the strict rules that govern repeatability criteria with someone who discards logic in favor of a predetermined scenario, offers specious evidence, and makes the rules as he chooses to ensure a more desirable end result for himself. Young considers an ancient dilemma. "Why righteous people suffer is a serious problem for those who believe in miracles and in a personal god who protects them." Many determined believers have no problem with this question: they can improvise. Firstly, in their worldview, God always has a purpose. No matter how obscure, how apparently contrived, convoluted, and inconsistent with his other purported attributes, his reason is incontestable and paramount. His omniscience always trumps human understanding and exonerates the Almighty of any possible error or bad intention.

In "Questioning Authority" Young resignedly avers, "it is almost impossible to respond..." to the absolute certainty with which some theists couch their arguments. While scientists freely admit that their trade inherently is composed of theories and hypotheses that inevitably contain errors, often of unknown magnitude, how does one deal with a belief system founded on the premise of absolute certainty in all things, particularly when many such systems exist today and countless others have existed in the past, virtually all claiming to be the sole receptacle of truth?

The answer is that one can't. There are, no doubt, some scientists who are willing to concede that some overlap exists where science and religion share a common ground. There are, no doubt, religionists who would agree. However, the idea is not popular among many scientists. E.O. Wilson, professor of science at Harvard University, had this to say, "Although many theologians and lay philosophers like to deny it, I believe that traditional religious belief and scientific knowledge depict the universe in radically different ways. At the bedrock they are incompatible and mutually exclusive."

Science is confident that its motivation to understand nature and to inform society of its discoveries is its proper role. Generally, it sees no obligation to accommodate itself to religion or any other belief system not founded on empirical evidence.



The Gullibility of Conan Doyle

WILLIAM HARWOOD

Final Séance: The Strange Friendship Between Houdini and Conan Doyle. By Massimo Polidoro. Prometheus Books, Amherst, New York, 2001. ISBN 1-57392-896-8. 264 pp. Hardcover, $25.

I have long been aware that Sir Arthur Conan Doyle ended his friendship with Harry Houdini on account of Doyle's blind, gullible belief in the very scam Houdini had disproven over and over. But not until I read *Final Séance* did I become convinced that incurable adherence to a security belief in the face of irrefutable evidence can only be described as a form of insanity. And I am far from the first person to reach that conclusion.

Following the publication of Doyle's second pro-Spiritualism book, the *Sunday Express* ran the headline in its book column, "Is Conan Doyle Mad?" So far as I am aware, no publication of comparable influence has been similarly blunt in connection with Doyle's spiritual successor, Shirley MacLaine. It is understandable why "political correctness," requiring more circumspect

William Harwood is the author of Mythology's Last Gods *(Prometheus, 1992), editor/translator of* The Judaeo-Christian Bible Fully Translated *(Imprintbooks 2001), and author of four books of fiction.*

criticism, is not to everybody's taste. Not faced with such constraints, the *Express* went on, "One does not trouble to analyze the ravings of a madman. One shrugs one's shoulders, laughs, and forgets." The more polite *London Times,* reviewing Doyle's previous book, referred to Doyle's "incredible naiveté," while the *Nation* stated, "The book leaves one with a rather poor opinion of the doctor's critical abilities" (169). And when even an investigator as incredibly gullible as J.B. Rhine (who went on to authenticate ESP in a horse) saw through one of Doyle's pet mediums, Doyle placed a notice in the Boston newspapers, "J.B. Rhine is an Ass" (203).

Houdini was religiously conservative, even disowning one of his brothers for violating one of Leviticus's sectarian taboos (218–219). And when he testified before a Congressional committee in support of an anti-fortune-telling bill, he said:

> This is positively no attack upon a religion. Please understand that emphatically. I am not attacking a religion. . . . But this thing they call 'spiritualism,' wherein a medium intercommunicates with the dead, is a fraud from start to finish. There are only two kinds of mediums, those who are mental degenerates and who ought to be under observation, and those who are deliberate cheats and frauds. I would not believe a fraudulent medium under oath; perjury means nothing to them. . . . Millions of dollars are stolen every year in America, and the Government [has] never paid any attention to it, because they look upon it as a religion.

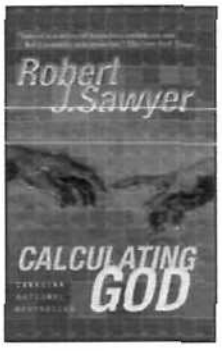
Substitute "televangelism" for "spiritualism," and the obvious response is, "So what else is new?" And when Polidoro writes of a paranormal hoax exposed by Houdini, "It was a typical swindle, still used today by many self-claimed psychics, astrologers, and charlatans. By this means Reese had been able to gather sums of money from gullible people who, more often than not, were also learned men of science and culture," the response is again, "So what else is new?"

I was surprised to learn that, while Conan Doyle was en route to Australia, some Australian Presbyterians held a prayer meeting to ask their sectarian god to prevent the proponent of an opposition religion (Spiritualism) from reaching their shores alive. A fringe cult in Vancouver in 1962 held a similar prayer meeting to petition that a stage hypnotist not be permitted to perform in their city. The god did not answer that request either.

Polidoro does not devote much space to Doyle's authentication of the Cottingley fairies, other than to quote a couple of statements in which Doyle expressed his conviction that little girls do not lie. That little girls (and boys) are humankind's most notorious liars was quite unknown to him.

On the question of whether Arthur Ford correctly identified the message Houdini had promised to communicate to his widow if he ever came back, Polidoro quotes enough statements from Bess Houdini to make clear that only her desperate desire to believe led her to an initial authentication of Ford's claim. On sober reflection, she realized that Ford had simply picked up published clues and capitalized on her willingness to believe that the message was what Houdini *would have* sent her if he had been able. It was not a message that he had pre-arranged to send her. Doyle, not surprisingly, was convinced that Ford had indeed communicated with Houdini, and no one could convince him otherwise.

Even after Houdini's death, in a letter to Bess Houdini, Doyle reiterated his stubborn conviction that Houdini possessed the very powers he devoted his life to refuting, including an ability to dematerialize his body in order to pass through solid walls (225). In doing so, he foreshadowed the parapsychologists at George Washington University, St. Louis, who, after James Randi's "Project Alpha" had exposed their gullibility by having them pronounce the illusions of two youthful conjurers as genuine psychic phenomena, actually asserted that Randi's associates really were psychics who for some reason were now pretending to be magicians. Will believers in pseudoscience ever learn to distinguish between sense and nonsense, and face the reality that their superstitions have been as fully disproven as phlogiston and the planet Vulcan? Only if Barnum was wrong.



Using Science Fiction to Promote Creationism

BARRY F. SEIDMAN

Calculating God. By Robert J. Sawyer. Tor Books/Forge, 2001. ISBN 0812580354. 352 pp. Softcover, $6.99.

Robert Sawyer, some say, is Canada's answer to Michael Crichton. I would agree. Like Crichton, Sawyer tells a fascinating story in a fun-filled manner. Also, like Crichton, Sawyer confuses science with fantasy.

There is one major difference between both writers: Crichton plays with dinosaur DNA and super-mysterious Spheres, never trying to claim this fiction is hard-science fiction. He is the perfect science-fantasy writer, balancing his art somewhere between George Lucas and Greg Bear.

Barry F. Seidman is Executive Director of the Center For Inquiry's Metro NY Center in Montclair, New Jersey.

Sawyer, however, has written many hard-science fiction books, many quite fun to read, like his *Quintalaglio Trilogy*, *Starplex*, and *Illegal Alien*. He has cited the great scientists of the past two centuries from Galileo to Sagan, Darwin to Gould. But with his book *The Terminal Experiment*—where he claims scientists find proof for the soul—Sawyer began to use his fiction more as a weapon of anti-science propaganda rather than entertainment.

This is most certainly true of his latest book—recently published in mass-market form—*Calculating God*. In this book, Earth is visited by two different alien species, the Forhilors and the Wreeds. Both species have come to the conclusion that science has proven the existence of God, and Sawyer's human scientists must deal with the fact that these aliens are not Jerry Falwell, but advanced intelligent life far ahead of humans in technology. Alas, it is perfect way for Sawyer to claim that creationism and God-belief is the intelligent response to our universe.

Sawyer began to use his fiction more as a weapon of anti-science propaganda rather than entertainment.

From the line on page 18 stating, "That we live in a created universe is apparent to anyone with sufficient intelligence and information," to Sawyer's conclusion that the aliens' God really does exist, creationism is par for the course in *Calculating God*.

The premise backing the alien's creationism? The Anthropic Principle, which states that the universe "seems" to be such that with the slightest change of physics and chemistry, it would not be able to sustain life; therefore, that this universe happened to indeed have life (at least on Earth as readers must remember, we have not found Forhilors or Wreeds quite yet), means that this universe is one amazing lucky chance for us all!

But chance is not what Sawyer has in mind. As much as he tries to prove this, however, by stating coincidence after coincidence, he cannot scientifically rule out either the multi-universe idea, or any other scientific explanation which would show chance is the key factor indeed. The only way Sawyer does back up his pseudoscientific ideas in his novel is via his alien creations.

Sawyer proposes a universe where all life seems to be so similar that evolution on all planets followed the same cycles, producing only minor differences in form. He even concocts the absurd idea that the two alien worlds and Earth went through the exact same kind of mass extinctions, at the exact same time; and, of course, this was caused by God toward His ultimate goal for life in the universe.

Sawyer also includes more traditional creationist ideas like how cilia or the human eye could not have formed one step at a time and still be functional at each step. He chooses to ignore Richard Dawkins's work in this, which clearly explains that irreducible complexity is just a bad idea. Sawyer's aliens ask of humans how we could "believe in" evolution's idea of speciation if we have never seen a fish turn into a human. Or, how could we "believe" in the Big Bang if we cannot know what occurred at the origin of the universe "absolutely." Of course, by this Sawyer commits the fallacy that scientific theory is just the same as everyday theorizing. We *have* shown how speciation occurs and that the Big Bang has occurred; we do not need an expanded lifespan to know these scientific theories are true.

In his novel, as in past works, Sawyer talks about two great scientific minds: Carl Sagan and Steven Jay Gould. But he chooses, with Gould, to focus on his book, *Rock of Ages*, which promotes the idea of "non-overlapping magisteria" of science and religion. With Sagan, he considers Sagan's one and only novel, *Contact*, as being pro-God. It is amusing that this reference appears in *Calculating God*. About three years ago, this writer had an e-mail dialogue with Sawyer on his pseudoscience award-winner *Terminal Experiment*. In that conversation he brought up *Contact* and said to me just what he later wrote into *Calculating God*. "It [*Contact*] said that the universe had been designed, created to order by a vast sentience . . . [Sagan] . . . allowed the possibility of a creator." He then went on to say, as he did in the conversation with me, that Sagan did not have to believe what he wrote in the novel any more than George Lucas had to believe in the Force from *Star Wars*. But clearly, Sawyer wants to discredit these two atheist scientists by addressing that somewhere beneath their hard exterior lives(ed) a man of faith after all.

In the end, the God of *Calculating God* is some sort of superior entity who plays with universes to create offspring in its own image. Sound familiar? Of course, if such a creature existed, as startling as it might be, it would certainly be a challenge for science and not religion. It is time for Sawyer to reconsider himself a fantasy writer, or a science-fantasy writer at most, and stay far, far away from hard science fiction. □

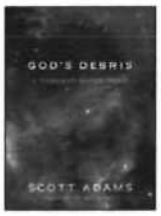
Listing does not preclude future review.

The Age of Science: What Scientists Learned in the Twentieth Century. **Gerard Piel.** Basic Books, 10 East 53rd Street, New York, NY 10022-5299. 2001. ISBN 0-465-057545-1. 460 pp. $40, hardcover. This book has been aptly called "magisterial." The founder (in 1948) and publisher (until 1986) of the modern *Scientific American* here undertakes "to tell my readers what I have learned about what scientists learned in the twentieth century, in sum: The work of science is converging on seamless comprehension of the world around us and the identify of ourselves in it." Eight sections explore "Science Is What Scientists Do," "Revolution at the Ground of Knowledge," "Light and Matter," "Space and Time," "The Living Cell," "Earth History and the Evolution of Life," and "Tools and Human Evolution." A grand survey from an elegant voice of science. With illustrations by Peter Bradford.

The Encyclopedia of Extraterrestrial Encounters. **Edited by Ronald D. Story.** New American Library, 375 Hudson Street, New York, NY 10014. 2001. ISBN 0-451-20424-7. 681 pages. $19, softcover. (Also available in a special CD-ROM version for $9.99 postpaid from the author's Web site www.RonaldStory.com.) Subtitled "a definitive, illustrated A–Z guide to all things alien." About 400 entries on alien mysteries and the search for extraterrestrial intelligence by one hundred contributors including noted scientists and UFO writers. This is the fruition of Story's twenty-five-year UFO Encyclopedia Project.

Elusive Innocence: Survival Guide for the Falsely Accused. **Dean Tong.** Huntington House Publishers, P.O. Box 53788, Lafayette, LA 70505. 2002. ISBN 1-56384-190-8. 278 pp. $15.99, softcover. Child abuse is a serious problem that should concern everyone, but so is the epidemic of false accusations that too frequently (71 percent of the time, according to the National Center for Child Abuse and Neglect) surround them. This book is an attempt to help parents, attorneys, and other professionals who fall victim to, champion, and don't understand these 71 percent of unfounded and false cases. It is what the author calls "the reverse cycle of child abuse." Most of the false allegations are not founded in malice but are the result of improper interview techniques, confirmatory bias, source misattributions, and delusional accusers. The book, says the author, is an attempt to help the unjustly accused reclaim their good name, their children, and their rights.

Evolution: The Triumph of an Idea. **Carl Zimmer.** HarperCollins Publishers, Inc., 10 East 53rd Street, New York, NY 10022. 2001. ISBN 0-06-019906-7. 364 pp. $40, hardcover. Introduction by Stephen Jay Gould. The companion volume to this past year's ambitious seven-part PBS television series "Evolution," part of the Evolution Project, a coproduction of WGBH/NOVA and Clear Blue Sky Productions. The project also includes a Web site, a multimedia library, and an education outreach program. In thirteen chapters, Zimmer presents a rich and up-to-date view of evolution. He explores the far-reaching implications of Darwin's theory and the power, significance, and relevance of evolution to our lives today. The book's subtitle unabashedly acknowledges the forthright scientific viewpoint throughout. A thirty-two-page final chapter, "What About God?" addresses the "cacophony of opinions" on that subject. With 140 color illustrations.



God's Debris: A Thought Experiment. **Scott Adams.** Andrews McMeel Publishing, 4520 Main Street, Kansas City, MO 64111. 2001. ISBN 0-7407-2190-9. 132 pp. Hardcover. $16.95. Scott Adams is the creator of the cartoon Dilbert, but this quirky little book is Adams's first non-Dilbert, non-humor book. He calls it a 132-page thought experiment wrapped in a fictional story. He says the target audience is "people who enjoy having their brains spun around inside their skulls." In short dialogues, fictional characters consider a variety of opinions and philosophies about God, belief, physics, free will, science, evolution, light, the delusion generator, reincarnation, ESP, and the "Skeptics' Disease"—a short, unflattering portrayal of skeptics as people prone to group thinking who "attack irrational thinkers and in the process become irrational."

Our Cosmic Habitat. **Martin Rees.** Princeton University Press, 41 William Street, Princeton, NJ 08540-5237. 2001. ISBN 0-691-08926-4. 205 pp. $22.50, hardcover. The noted cosmologist Martin Rees, Astronomer Royal of Great Britain, starts with the question of "whether God

A Bunch of 'Borderlands'

A listing in our September/October 2001 New Books column of Michael Shermer's *The Borderlands of Science* prompted a friendly note from Charles Sheffield about possible confusion with his 1999 book *Borderlands of Science* (Baen Publishing, Riverdale, New York). Sheffield, a scientist (chief scientist at Earth Satellite Corporation) and science fiction writer, thought we might want to let readers know about his book as well. We're happy to do so, as it is interesting and not irrelevant to our concerns. Subtitled "how to think like a scientist and write science fiction," it is, he says, for "the writer or critical reader who likes the science of stories to be right." Sheffield defines "borderlands" as the frontiers of today's science. The book roams over such subjects as the frontiers of physics, the constraints of chemistry, the limits of biology, far-out alternatives (faster than light travel, wormholes, etc.), and future war. A final chapter, "Beyond Science," discusses "scientific heresies, . . .ideas that are already beyond the boundaries of accepted science," and he includes Gaia, Dr. Pauling and vitamin C, cold fusion, no-Big Bang, free energy, and wild powers.

And while we are mentioning these two different but similarly named "borderlands" books, I'll add a plug for our own first anthology of SKEPTICAL INQUIRER articles, *Paranormal Borderlands of Science*, published in 1981 by Prometheus and still in print, even though three more major anthologies in the same series, and some smaller ones, have followed. — *K.F.*

could have made the world differently." Specifically, he explores the notion that our universe is just a part of a vast "multiverse," or ensemble of universes, in which most other universes are lifeless. What we call the laws of nature would then be no more than local bylaws, imposed in the aftermath of our own Big Bang. Our cosmic habitat might then be a special, possibly unique universe where the prevailing laws of physics allowed life to emerge.

Portraits of Great American Scientists. **Edited by Leon M. Lederman and Judith Scheppler.** Prometheus Books, 59 John Glenn Drive, Amherst, NY 14228-9827. 2001. ISBN 1-57392-932-8. 305 pp. $28, hardcover. Fifteen biographies of noted scientists (among them Marvin Minsky, Steven Pinker, George Smoot, Vera Rubin, Charles Townes, E.O. Wilson, and Edward Witten) reveal some of the excitement of scientific discovery, how they chose their careers paths, what obstacles they had to overcome, and their views on the role of science in society. The biographical sketches are written by young students from the Illinois Mathematics and Science Academy in a project directed by Nobel laureate Lederman.

Real-Life X-Files: Investigating the Paranormal. **Joe Nickell.** The University Press of Kentucky, 663 South Limestone Street, Lexington, Kentucky 40508-4008. 2001. ISBN 0-8131-2210-4. 336 pp. $27.50, hardcover. CSICOP Senior Research Fellow and SI "Investigative Files" columnist Joe Nickell brings his formidable investigative skills (a one-time private investigator, he's also a forensics expert and a noted document examiner consulted in many famous cases, and oh, yes, he has a Ph.D. as well, with an emphasis on literary investigation and folklore) to more than forty allegedly paranormal mysteries. Topics include the devil's footprints, spontaneous human combustion, crop circles, police psychics, monster claims, supposed hauntings, weeping icons and crystal tears, the extraterrestrial autopsy, stigmata, and so on. As SI readers will know, he always takes a highly focused hands-on, case-study approach to mysteries and is never dismissive. Nickell feels claims and mysteries deserve and require careful investigation with a view toward solving them.

Yours Faithfully, Bertrand Russell: A Lifelong Fight for Peace, Justice, and Truth in Letters to the Editor. **Bertrand Russell. Edited by Ray Perkins, Jr.** Open Court Publishing, 332 S.Michigan Ave., Chicago, IL 60604. 2001. ISBN 0-8126-9450-3 (paper), 0-8126-9449-X (cloth). 448 pages. $26.95 softcover, $52.95 hardcover. One of the twentieth century's greatest philosophers (and greatest skeptics according to a recent SI poll), Russell was also a political activist who used letters to the editor as one of his weapons in his fight for peace, justice, and truth. He wrote approximately 400 letters to the editor, and three-quarters of them are reproduced in this volume. They include virtually every argument he made in a letter to the editor.

—Kendrick Frazier

SCIENCE BEST SELLERS

Top Ten Best Sellers in **New York**

1 ***Uncle Tungsten: Memories of a Chemical Boyhood***
Oliver W. Sacks
Knopf

2 ***The Elegant Universe: Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory***
Brian Greene
Vintage Books

3 ***Strange Brains and Genius: The Secret of Eccentric Scientists and Madmen***
Clifford A. Pickover
Quill

4 ***Three Roads to Quantum Gravity***
Lee Smolin
Basic Books

5 ***Facing Up: Science and Its Cultural Adversaries***
Steven Weinberg
Harvard University Press

6 ***A New Kind of Science***
Stephen Wolfram
Wolfram Media, Inc.

7 ***The Best American Science & Nature Writing 2001***
Edward O. Wilson (Editor), Burkhard Bilger
Houghton Mifflin

8 ***The Undiscovered Mind: How the Human Brain Defies Replication, Medication, and Explanation***
John Horgan
Free Press

9 ***How the Mind Works***
Steven Pinker
W.W. Norton & Company

10 ***The Secret Life of Dust: From the Cosmos to the Kitchen Counter, the Big Consequences of Little Things***
Hannah Holmes
John Wiley & Sons

By arrangement with Amazon.com, January 2002.

It's Life, Captain—But Only As We Know It

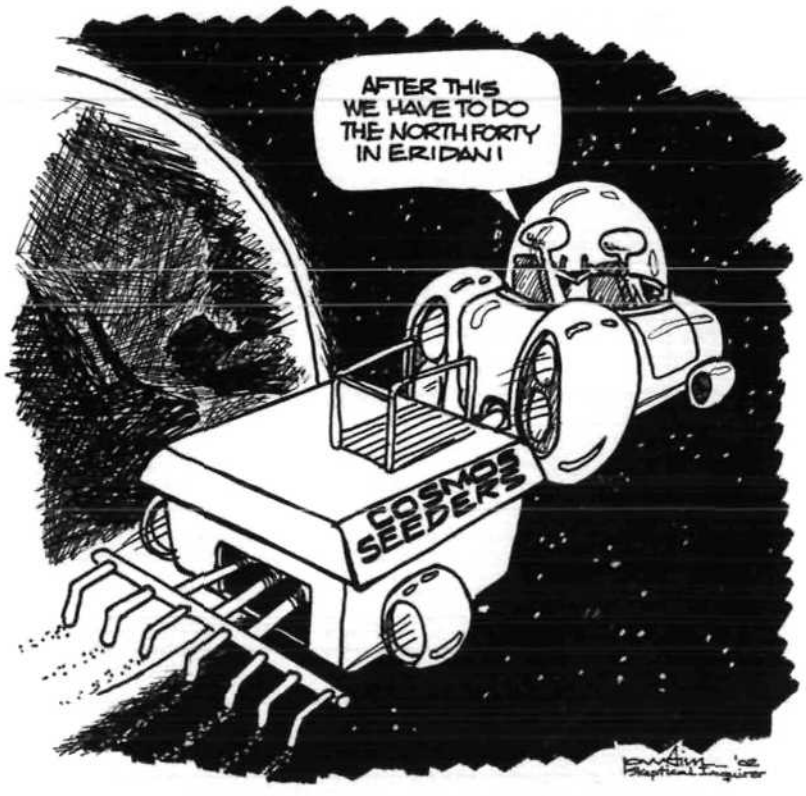
RALPH ESTLING

For more than twenty-five years Fred Hoyle, who died August 20, 2001, and Chandra Wickramasinghe argued that life on Earth could not possibly have originated on this planet. It was, the two astrophysicists maintained (against fierce opposition from establishment biologists, and just about all other biologists), transported here, and is still being transported here, through interstellar space via comets.

It is known that some comets contain water ice and organic molecules. Hoyle and Wickramasinghe stated that comets also contain fully viable bacteria and viruses and the intermittent arrival on Earth of these life forms also accounts for many if not all of the epidemics, pandemics, pestilences, and plagues that have assailed Earth's population over the millennia, right down to the present. This is not known.

Last July at a conference in San Diego, Professor Wickramasinghe declared categorically that he and his team had discovered bacteria twenty-five miles up, well into the stratosphere, and that these bacteria must assuredly be of extraterrestrial origin to be at that height. This is an intriguing speculation and we are still awaiting an announcement, by independent investigators, on whether these microbes are terrestrial or

Earth life may have originated on Earth *and* new life forms in the shape of bacteria and viruses are being brought here all the time, courtesy of visiting comets.



Our frequent columnist Ralph Estling writes from Ilminster, Somerset, England. He says he admires science and logic and when the two don't mesh as well as he would like, he starts to worry, and then he writes about it and then worries some more. Between the worry and the writing something may emerge, but he's not too sure what. Come to that, he says, he's not all that sure about a lot of things. . . .

not. They *look* like Earth bacteria but then if we have been showered with alien bacteria these past 4 billion years or so it can be argued that this is only to be expected, if our bacteria are direct descendants of these alien bacteria.

In a letter to the British newspaper *The Independent* Wickramasinghe wrote: "The step from chemical building blocks to fully fledged microbial life involves superastronomical improbabilities, and there is no evidence whatsoever that this step ever took place on Earth."

Almost all biologists are convinced it did. Furthermore, they say, it is absurd to talk about "the" step because there would have been a long series of gradual, sequential, and cumulative steps, from prebiotic molecules to protobiotic ones, through the well-established process of Darwinian natural selection, and therefore no "superastronomical improbabilities." This too is an intriguing speculation for which we await evidence.

It is possible that both hypotheses are right, as they are not mutually exclusive. Earth life may have originated on Earth *and* new life forms in the shape of bacteria and viruses are being brought here all the time, courtesy of visiting comets. The point is that so far we have no real proof for either hypothesis, and until we do we would do well to eschew all assumptions and advocacies.

All gall is divided into three parts: assumption, advocacy, and an unshakable maintenance of that assumption and that advocacy through thick and thin thanks to a total disregard of the evidence, and lack of it. This being so, let us examine possibilities.

We might begin by saying that Hoyle and Wickramasinghe's notion of panspermia, life floating around the cosmos looking for suitable planets to land on and colonize, doesn't really answer the question of how living things developed out of non-living chemicals in the first instance at *some* time and in *some* place in the universe; it had to start *somewhere* or other, no? But then we're forgetting that Hoyle was one of the founding fathers of "steady-state," the idea that the universe, like Topsy, never was born but always was. That being the case, and almost all astrophysicists assert that it isn't, life too always was; it wouldn't have originated anywhere. Okay? Well, no, not really.

The claim that life cannot possibly, even over millions of years, evolve from non-life does not look too strong.

The claim that life cannot possibly, even over millions of years, evolve from non-life does not look too strong. Both non-life and life are constructed out of chemicals and, though viruses and bacteria are far more complex structures than the most complicated non-living molecules, there seems to be no overwhelming reason to assume it's not possible for a gradual evolution of a simple chain of the right molecules towards more and more elaborate ones to occur, until a point was reached where their self-replication imperceptibly and over many years of trial and error changed from a chemical to a biochemical process, with the more viable forms driving out the less viable ones in the fine old Darwinian struggle for existence. Occam's razor would seem to indicate this as the simplest, most logical solution.

Of course, simplicity and logic don't prove it, but they help. Nature is well known for its laziness, as well as its logical ways. And we know to our sorrow that viruses and bacteria can mutate very rapidly, so that yesterday's antibiotics no longer work today, a consequence of natural selection if ever there was one. Our medicines may destroy 99 percent of the germs, so that 1 percent that survive because they have natural immunity reproduce immune offspring, and so in no time at all we're back at Square One. We've been told that nature never favors the individual, particularly the aberrant individual, only the species. What we've been told is dead wrong. The odd-bug-out that can take the streptomycin and still laugh is the bug that we'll be hearing from, and dying from. We don't need alien germs to kill us. Our own home-grown ones will do the job very nicely.

So, what about bacteria found twenty-five miles up? Well, bacteria have been located in boiling hot sulfur springs, in ice, in rocks miles below the surface of the land, and in hydrothermal vents miles below the surface of the sea. Why not in the stratosphere? They're a ubiquitous bunch and I don't think they need any rides on any comets but started out right here, 4 or so billion years back. I can't prove it but I think so.

Tell you what. Just to make things interesting, I hereby bet Professor Wickramasinghe £10 (about $14 in real money) that those stratospheric bacteria turn out to be Earthly after all. Which will be a shame. I'd like them to be ETs, even if it costs me a tenner.

The thing is, life is a tough little cookie. It's hard to believe there isn't a lot out there, most of it home-grown and most of it, like most life on Earth, microbial. But couldn't some of it, here and there around the cosmos, be something more? □

Why Evolution Makes Me Feel Better

SUSAN BURY

Tarot, astrology, New Age, and (God forgive me) religion: these schemes each have a great following, I think, because they make people feel better. They offer the hope that people can somehow control or at least predict the forces of the universe that shape their lives.

As I've come to understand evolution, however, it's actually made me feel much better than any philosophy or practice that pretends to universal power.

For example, any given species' meatball of evolutionary success rests on a spaghetti of events and conditions, from genetic mutations to climate shifts, that may never be fully unraveled. This concept has helped me understand that any one event is the result of countless previous events bumping and slipping their way through time.

If I lose a loved one in a terrorist attack or some other event, it's not because "God wanted him in heaven," as claimed by so many understandably emotional but misguided survivors. It's because the combined effect of countless events resulted in the unfortunate victim being in the wrong place at the wrong time. That's a bit less dramatic and flattering than God having a special eye on members of your family, but perhaps a little more humility would do us all good.

We can similarly ease up on the notion of "if only . . ." as in "If only my loved one had driven to that business meeting instead of taking the ill-fated airplane, she'd be here today." Well, maybe, but statistically, as we all know, she would have been in far greater danger driving than flying. Perhaps we could all save ourselves a great deal of painful second guessing by realizing that we cannot possibly control or predict the myriad factors that lead to any given occurrence.

Evolution has helped rid me of the illusion that mankind will conquer disease. Like it or not, disease is a form of life. Bacteria and viruses exist not to make us miserable or threaten our lives but simply to live and reproduce. We're nothing more than super-sized vehicles for their proliferation. And they're going to continue evolving right along with us. In the first weeks of the anthrax scare, there were already news articles suggesting that overuse of the antibiotic Cipro might cause antibiotic resistance in bacteria. That is, random gene mutations might allow some bacteria to evade the drug, and descendants of those antibiotic-resistant bacteria could spread widely, creating even greater public health problems.

It's comforting to think that if we just have enough walkathons and celebrity fund-raisers, we'll cure everything. But a realistic understanding that disease is a distant cousin may help us adopt more sensible expectations of science and medicine—not to mention politicians.

Evolution helps me accept that the human species does not in any way represent an endpoint, a pinnacle, or perfection. Evolution doesn't produce perfection. Each species is as good as it needs to be at the moment in order to survive, reproduce, proliferate, and snatch up ecosystem niches faster than somebody else.

For me, this has taken some of the hand-wringing bewilderment out of evil and terror. Instead of shaking my head at the TV news and muttering "How can people act that way?" I can perceive (albeit not understand or accept) each person's behavior as the product of a genetic bundle buffeted by the winds of environment, right from the womb through those crucial early months and years, into adolescence, and through adulthood. When I learn about an international terrorist or hardened criminal, I'm not burdened by questions like "How could God put such a person on earth?" I can move on to questions like "What do we do about this creep?"

Picking up on that last point, evolution lifts a lot of pressure from me to be perfect. I know from the number of self-help books and articles on perfectionism that I'm by no means the only person to suffer this malady. If I can remember that I, too, am a product of a genetic package unfolding in an uncertain environment, then I can forgive myself for the all-too-human aspects of my own behavior. I can let myself and those around me off the hook for feeling irrational fears in the midst of pervasive uncertainty.

Perhaps most important, evolution removes the specter of divinely wrought cataclysm and puts the future of humankind squarely on our own shoulders. To date, evolution has resulted in a human community with a generally accepted sense of right and wrong. Every generation has its measure of evil but also its share of generosity and courage, demonstrating that we have the will to do something about injustice and cruelty. While it's daunting to realize that, in fact, we're the ones who've got the whole world in our hands, it's also inspiring and hopeful. □

Susan Bury is a science writer in Red Lodge, Montana.

Editor's note: Earlier letters on the topic appeared in our January/February 2002 issue, but we thought this comment merited publication.

Comments on Martin Gardner's 'Multiverses and Blackberries'

BRYCE DeWITT

Martin Gardner is one of the best and most intelligent debunkers of pseudoscience, and therefore it is sad to see him stumble in his review of the many worlds interpretation of quantum mechanics (SKEPTICAL INQUIRER, September/October 2001). This interpretation, put forward by Hugh Everett III as a doctoral dissertation, was submitted to the July 1957 issue of the *Reviews of Modern Physics*. I was editor for that issue and *had* to read it. I think only Everett, John Wheeler (his thesis advisor), and I understood it. It was totally ignored by the physics community for the next thirteen years.

I was shocked by it, but also delighted, because it was the first fresh statement on the interpretation of quantum mechanics that had appeared in decades. Everett had already written a much larger work, which didn't get published until 1973. *It* should have been his thesis, but Wheeler would not allow it. Wheeler told me once that he sat down with Everett and told him precisely what to write, so Wheeler was really the author of the 1957 version. Wheeler perhaps felt that the bigger work was too revolutionary, and he may not have wished to offend his old hero Niels Bohr.

During the sixties my research interests, as now, lay elsewhere, but I always felt that Everett had been unjustifiably neglected. So in 1970 I wrote an account of his ideas for *Physics Today*. After that he could no longer be ignored. I am responsible for calling Everett's ideas the "many worlds interpretation." Everett never used the expression, although in his longer work (his Urwerk) he referred to "splitting observers." I have never used the term *parallel universes*. It is the jargon of science fiction.

The chief problem that Everett was trying to resolve was that of fuzzy thinking on the part of scores of authors, some of them quite prominent, who had written incredibly dull papers on how they understood quantum mechanics. His "revolutionary" idea was simply to assume that quantum mechanics provides a description of reality in exactly the same sense as classical mechanics was once thought to do. The formalism should be allowed to speak for itself. Words like *splitting* or *many worlds* should not be used as substitutes for the mathematical theory, and if the words offend then one should choose others.

The result is a completely deterministic theory, and one is obliged to extract from it the statistical laws that hold in our own corner of reality (as well as in all the other corners). This David Deutsch has done. It is not necessary to impose the probability interpretation from outside. Everett's greatest impact on physics has been to foster clear thinking about the quantum theory. He has also allowed cosmologists to think, without embarrassment, of a wave function for the universe.

The first point at which Gardner stumbles is in focusing solely on quantum measurements as the agents of the splitting into many worlds. In a quantum measurement an observable of a low-inertia system (for example, an atom) is measured by a carefully prepared high-inertia apparatus. But there is another situation that is far more important, namely when a high-inertia system (for example, a human being or a planet) is brought into a "classical" state through interactions with its environment of photons, atmospheric molecules, cosmic rays, etc. This "classicalization" has become well understood only in the last fifteen years under the rubric of "the consistent histories theory." It is this process that leads to stupendous numbers of simultaneous "classical" worlds.

Gardner bemoans the radical violation, implied by these insights, of the principle of Occam's razor, which urges scientists to keep entities to a minimum. According to him, if an entity is unobservable, then its existence should be denied. A consistent application of this logic would force one to deny the existence of planets in distant galaxies. Some day such planets, as well as the "other worlds," may become observable, at least indirectly. One should remember that in the nineteenth century many physicists denied the existence of atoms.

The many worlds interpretation *does* satisfy Occam's principle in the sense that it keeps *concepts* to a minimum, taking the mathematical formalism as it stands without adding excess metaphysical baggage in the form of "collapsing wave functions"

Bryce DeWitt is a professor of physics, emeritus, at the University of Texas at Austin, and a member of the U.S. National Academy of Sciences.

or probabilities imposed from outside. The implications of this "bare bones" interpretation are admittedly bizarre. But physicists have learned over the years that it is almost always rewarding to push any formalism (Maxwell's electromagnetic theory, Einstein's relativity theory, quantum field theory) to its most extreme logical conclusions.

It is unfortunate that Gardner lowers the level of his argument by dragging in science fiction and the rather far-out speculations of some professional philosophers. Guilt by association has never been a tenable doctrine, particularly when the association has never existed.

Gardner makes one blunder that is rather common: equating a deterministic world to absence of free will. The equation is meaningless until one gives a *testable definition* of free will.

Gardner quotes a recent poll showing that about half of all quantum mechanics experts now favor the many worlds theory, but then says that "most working physicists simply ignore the theory as nonsense." It will come as a surprise to the Nobel laureates Murray Gell-Mann and Steven Weinberg, as well as to Stephen Hawking, who all support the theory, to learn that they are not "working physicists."

Gardner also hints that supporters of the theory may be morally dishonest in that they often do not make clear "whether they think the other worlds are physically real or just abstractions such as numbers and triangles." *Is there any difference?* A question that I love to pose to mathematicians is the following: Is mathematics a pure invention of the human mind, or is it *there*, to be discovered? Almost invariably mathematicians of world-class stature answer that it is *there*. In other words, the world of ideas is at least as real as the visible world, and perhaps more so, a view that is as old as Plato.

Sadly, Gardner ends his article with the words "Surely, the conjecture that there is just one universe and its Creator is infinitely simpler and easier to believe than there are countless billions upon billions of worlds, constantly increasing in number and created by nobody." Does he have any idea of the complexity of the problem of trying to define the word *Creator*? And does he wish to imply that an omnipotent Creator could *not* produce billions of worlds? The many-worlds interpretation makes no statement for or against the existence of such an entity. □

Is mathematics a pure invention of the human mind, or is it *there*, to be discovered? Almost invariably mathematicians of world-class stature answer that it is *there*.

PSEUDOHISTORY IN JERRY VARDAMAN'S MAGIC COINS
from page 41

> Nazareth." He is mentioned frequently, often in titles and phrases found in the New Testament, for example, "Jesus, King of the Jews," "King," "the Righteous One," and "Messiah." Reference to the first year of his "reign" is repeated often . . . for example, "Year one of Jesus of Nazareth in Galilee [*sic*]." (1989, 72)

The absurdity of all this, officially and microscopically inscribed on every coin by the royal mint of the King of the Nabataeans in 16 A.D., stands without need of comment.

In addition to coins, Vardaman also "sees" microscopic letters on stone inscriptions—even though stone, by its roughness and exposure to weathering, would be even less likely to preserve such markings if they had ever been made. Indeed, large stones of the day were not polished, making it quite impossible for microscopic letters to be inscribed on them in any visible way. For the stone would more often than not simply chip, while natural pits and cracks would obscure anything that took, and the rest would be worn away by time. Yet he finds these tiny letters on numerous stones, including the famous *Lapis Venetus* inscription (a badly damaged stone now in the Vatican). In an unnumbered page appended to his 1998 lectures, entitled "The Problem of Theudas and Microletters on the Lapis Venetus," he says microletters on this stone declare that the Jewish rebel Theudas was king of the Scythians! This was a people living on the Russian steppes, a thousand miles from Judaea. I suppose Vardaman imagines him as a latter-day Spartacus of some sort. But common sense leads me to conclude that this is all nonsense on stilts.

Now for the punchline: There is no Quirinius coin. McRay's reference is to an unpublished paper that no doubt comes up with more complete nonsense about Quirinius in the reading of random scratches on some coin or other. But Vardaman hasn't even published this claim. Instead, almost a decade later, when he did present a lecture on the matter, his paper on the dating of Quirinius, though over twenty pages in length, never mentions this coin that apparently McRay read about. Instead, a date of 12 B.C. is arrived at using nonexistent microletters on a stone inscription (the very same *Lapis Venetus*). Hopefully this pseudohistory can be seen for what it is. Any claim based on this work must be held in the highest suspicion. □

COMMENTARY

Clear Thinking and the Forces of Unreason

KENDRICK FRAZIER

There is a new need for rationality and reason—as well as courage and resoluteness—in defense of freedom and democracy and the highest values of civilization. Since September 11 the world has changed, and a previous pop culture of superficiality, self-absorption, self-indulgence, and self-satisfaction has gone out the window with it. A several-decades period of relative innocence and naiveté has ended. Things are serious now, and we need all our wits about us. Intelligence and wisdom are called for. Clear thinking is in; fuzzy thinking is out—it is dangerous to all. We have seen evil, and there was nothing abstract about it. We must face it. We suddenly need to know more than what the latest pop celebrity is wearing, or who has the fastest computer chip, or who's got the latest great idea for instantaneous dot.com riches. We need to know about the world around us. We need to understand history, geography, culture, international politics, languages that virtually no one in the West speaks, and, yes, religion too. We suddenly need to know a lot about microbiology and how to combat the spread of agents of biological warfare. Learning and reading are suddenly in. Those involved in national security and arms control had long been saying it is still a dangerous world out there, but their warnings had fallen on mostly deaf ears. We were too distracted with living the good life. Now, suddenly, no one is distracted.

Much the same could be said for those of us toiling on behalf of science and reason and scientific skepticism. Paul Kurtz and CSICOP and many others in the skeptical movement have regularly been chided over the years for even raising the possibility that forces of unreason could actually threaten our modern democratic world, that opponents of reason, rationality, critical thinking, freedom, tolerance, openness, learning, and personal human and intellectual dignity might actually gain such a foothold as to be a threat to us all. I don't think anyone is saying that anymore.

We have long advocated not just good science but an open, scientific outlook—a viewpoint that values an open-mindedness to new ideas, a determination to let facts and evidence rather than wishes and preconceptions and ideology shape our judgments, skepticism toward assertions unsupported by good evidence, wide open debate and communication and publication, and the application of critical analysis and judgment at every step of the process.

Much of what we have critiqued has come under the rubric of the paranormal, of fringe science, of pseudoscience, of bogus science. Science is my passion, and all these represent anti-science or counter-science manifestations that confuse, taint, misdirect, delude, distract us all—but the believers most of all—from what the real world is all about. We no longer can indulge such distractions.

I think in the short term at least we are going to see less nonsense. Psychic abilities failed to warn us of the September 11 attacks, and now it should be clear to all but the most committed or muddle-headed that such powers just don't exist. The attacks were soon followed by bogus Nostradamus "predictions" and other inevitable claptrap, but those were quickly countered by anti-hoax, urban legend Web sites and frequent media stories debunking the BS and giving the true facts. The new real world has less tolerance for pretense. When the first anthrax attacks came, people turned to modern medicine, not unfounded remedies. As Bob Park of the American Physical Society pointed out in his "What's New" electronic newsletter, "Fortunately those exposed to anthrax are being diagnosed and treated with the very latest scientific medicine. They are not being treated with homeopathy, acupuncture, touch therapy, magnets, reflexology, crystals, chelation, craniosacral therapy, echinacea, aromatherapy, or yohimbe bark. And no one is complaining."

Yes, shameless promoters emerged claiming that certain herbal remedies, even homeopathy, might help against anthrax. Yeah, sure! I will give those claims credence when the first person with a *confirmed diagnosis* of anthrax rejects *any* application of antibiotics and insists on taking herbs or homeopathy, as the *only* treatment, *instead of (not in addition to)* modern antibiotics. *That's* the criterion we must hold *that* claim to.

Kendrick Frazier is Editor of the SKEPTICAL INQUIRER. *This essay was adapted from remarks in acceptance of the CSICOP In Praise of Reason Award, Center for Inquiry conference, Atlanta, Nov. 9–11, 2001.*

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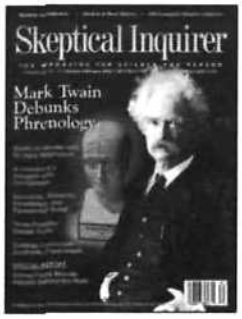

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So I think we now have, if only for a short time, a new era of no-nonsense. People know they have no choice but to confront the real world directly, on its own terms. There is no escape into a trivial, pretend world of nonexistent woo-woo.

* * *

I also want to offer a few words about the future of scientific skepticism and what might be called the modern skeptical movement. We celebrated our twenty-fifth anniversary this year. We are far from perfect and we have occasionally made mistakes, but I think CSICOP and the many scientists, psychologists, scholars, writers, and investigators worldwide who make up the movement have done, all in all, a remarkable job of defending science and scientific inquiry. They have critically examined virtually every important case asserting powers or forces "unknown to science." They have helped educate the public and the media about what good science is all about. And they have helped keep alive, amid a media-driven frenzy of uncritical popular acceptance of outlandish nonsense plus postmodernist-driven obscurantism in too many parts of academia, the true scientific spirit toward claims of knowledge.

In my own twenty-fifth anniversary essays in the SKEPTICAL INQUIRER this past year (May/June and July August 2001), I made a number of recommendations for how to keep scientific skepticism strong, vital, and relevant for the twenty-first century. I'll mention only a few here:

- Continually emphasize what we are for: honesty, integrity, good science, clear thinking, intelligence, scientific literacy, science education, open scientific inquiry.
- Always strive to bring a scientific viewpoint—even an imaginative scientific viewpoint—to skepticism. Keep ourselves close to science. Science is exciting, intellectually stimulating, interesting, popular with the public, and all that can carry over to skeptical investigation.
- Treasure the imaginative/creative and the skeptical/evaluative aspects of science and keep them together, as they should be.

And now I'll add two more that I didn't mention in those essays:

- Fight, critique, and examine at all levels, but stay high-minded; keep the moral high ground. Paul Kurtz has exemplified that, and it must be continued.
- We must do everything possible to find and identify the next generation of leaders of the skeptical movement—bright, curious, intelligent, concerned young men and women knowledgeable about science and skepticism, concerned about unreason wherever it exists, and full of energy and determination to do all they can, in their own way, and able to communicate their passion to the broader public in all the diverse ways now available. I know many such people (some are working right now at or with CSICOP), but we need more, and they need encouragement from all of us.

The influence of both CSICOP and the SKEPTICAL INQUIRER has been significant. Both are widely referenced in scientific and scholarly publications as well as the popular media. CSICOP's media outreach efforts provide responsible, authoritative scientific information and experts to media worldwide.

The controversy and media and public interest that accompanied our founding still surround almost everything we do. I believe that maintaining close ties to the values of science and scientific inquiry has guided us through and around the worst thickets and pitfalls.

In my view, our reputation for commitment to scientific skepticism, reason and rationality, critical thinking, and scientific integrity is stronger than ever. That serves us well. It serves science well. And serves the public well.

As we find ourselves in the early stages of a period of human history riddled with fearful new perils we hoped we would never have to face, our battles for clear, realistic thinking and against the forces of unreason—wherever they manifest themselves—are more important and more relevant today than ever before. □

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Biology Teachers and Creationism

Randy Moore ("Educational Malpractice: Why Do So Many Biology Teachers Endorse Creationism?" November/December 2001) missed one of the major reasons for the low level of scientific literacy among high school science teachers.

Simply put, very little science is taught in college-level science courses! In introductory classes, chemists teach the basic data of chemistry, physicists teach the basic data of physics, geologists teach the basic data of geology, and biologists teach the basic data of biology. Very seldom are the basic fundamentals of scientific inquiry taught in any discipline related introductory course. A perusal of standard texts used in science introductory courses will reveal that the nature of a scientific explanation, what determines the internal validity of a hypothesis, and how a scientific theory can be distinguished from speculation are seldom if ever discussed. If these concepts are presented in the text, they are frequently given short shrift by the teachers as being unimportant to learning the data of the discipline.

Since advanced courses in a scientific discipline are restricted to content knowledge, secondary education majors who major in science will probably never be educated in the fundamentals of scientific inquiry. But I probably should not be too severe on high school science teachers for their poor level knowledge of scientific inquiry for I have experienced the same low level of knowledge of scientific inquiry among many college science teachers. For years I taught a course titled "Parapsychology: Science or Pseudoscience."

Over the years I had a large number of student projects that included surveys and interviews with teachers in many disciplines. Although these surveys would probably not meet the statistical standards for acceptable surveys, the results were consistent over the years. I was always astounded by the number of college teachers who could not recognize the logical elements of a scientific explanation or theory.

If college professors don't understand the nature of scientific inquiry then we should not be too surprised if their students, the future high school science teachers, do not as well.

Norman R. Remley
Emeritus Professor of Psychology
Texas Christian University
Fort Worth, Texas

I was disheartened to read Randy Moore's article "Educational Malpractice," but not especially surprised. It is tragic but not unexpected that students and teachers are poorly educated in science. One only has to listen to presidents, congressmen, and Supreme Court justices to realize that quality science education has not seeped through to even the end products of our education system. It strikes me, though, that we are distorting our focus by worrying about the conflict between evolution and creationism. The focus of science education should not be to win points in the game of evolution versus creation, but to effectively educate students (and teachers apparently) to understand the methods of science and the importance of this investigative process in understanding our universe. Teaching students to understand the *reasons* for the methods of science is possibly more important than teaching any single science subject. In the end, students should be turned loose to make their own discoveries and contributions.

If young science students choose to apply the methods of science to search for an intelligent designer, so be it. Let them uncover some interesting discoveries along the way or find out that evidence for such a supernatural phenomenon is not reliable or doesn't exist at all. If science education is communicated properly, students will come to understand what information can be stated with confidence and what is not credible because of insufficient supporting evidence. Is there a better way to understand the meaning of the scientific method? . . .

Jeff Holtmeier
Silver Spring, Maryland

I am a physician not a schoolteacher, but the Moore article was one of the most interesting articles I've ever read. The statistics presented showing that almost half of Americans believe that humans were created in their present form 10,000 years ago were truly appalling. Teaching such concepts is ludicrous, and malpractice is a perfect analogy. In America a physician who bases his or her medical practice on magic or mysticism rather than science will eventually be out of a job. The same should be true for public school teachers.

Bruce L. Flamm, M.D.
bruceflamm@aol.com

Randy Moore's article sheds some much-needed light on serious problems with the teaching of science in the public schools. I'd like to mention another related problem, home schooling.

According to the U.S. Department of Education, nearly one million children are being home schooled. I believe the vast majority are fundamentalist Christians. I doubt that a significant number of these parents are remotely qualified to teach science. We have many home schoolers in this area and I can state unequivocally that they are being fed creationist pseudoscience. Thanks to our elected officials, it's all legal. In my opinion, it's a form of child abuse.

Victor Commisso
Lebanon, Pennsylvania

While reading of the representation of creationists among the population of biology teachers, I began to wonder what the career prospects within the field are overall for biology majors who espouse belief in creation over evolution. Obviously, the preference doesn't bear significantly on the choice of teaching as a career. Do other employers in the field of biology screen for the creationism/evolutionism preference, and, if so, what is the breakdown and how does it pan out, both for the employee as well as for the employer?

Wayne Orlicki
Murrieta, California

Why do evolutionists spend so much time "preaching to the choir," such as advocated in "Educational Malpractice: Why Do So Many Biology Teachers Endorse Creationism?" Will evolutionists ever convince anyone who is not already convinced by their epistemology? Now that Darwin is outdated, would it not be more productive to just put forth some modern-day simple proofs of "evolution" and then leave it at that? . . .

Because evolution is explicitly proven, we can get on to some other scientific work. As long as we are willing to disregard the philosophy of Rudolf Carnap altogether anyway, how about declaring the Big Bang a fact? And of course biologists have already told us that gravity and heliocentricism fall into their conceptual frameworks as facts. Why don't we just eliminate physics (especially relativity theory), astrophysics, cosmology, and a host of other sciences altogether? Would it not be more efficient to just put a theoretical biologist in charge and declare all hypotheses and theories of these other disciplines facts? There could even be the long sought after evolutionist's dream, a club of

unity. Perhaps it could meet in lieu of physics or chemistry class.

Daniel F. Baright
Lebanon, Missouri

Randy Moore indicated there have been a variety of explanations why we've done such a poor job of teaching students about evolution.

Perhaps the public's poor understanding of evolution is demonstrated statistically with the majority of Ph.D.'s believing in God. If the most educated members of our society believe in God, how are we ever to teach students? I believe the problem lies in deep-rooted human nature and not in educational techniques.

Andy Dunn
Upland, California

There are two points about Randy Moore's article on creationism in biology I would like to raise.

One, school boards the country over seem to thrive on controversy, even when the issues are unscientific, unproven or inappropriate to an educational setting. . . . So why is evolution exempt from the lack of consideration school boards show parents and educators? The question is unasked by Randy Moore and leads me to my second point.

If the SI staff had opened a biology textbook anytime in the past ten years, they might understand why even evolutionist teachers are squeamish on the subject. All the textbooks I've read, both high school and college, contradict themselves and other science classes.

They rely on outdated (the Miller-Urey Experiment), discredited (Haekel's embryo drawings), or faked (peppered moths) evidence to make their point.

If science education is to mean anything it must rely on the facts as we have them (even the Cambrian Explosion, excluded from all the books I've read so far) and on teaching scientific methods and reasoning or the creationism movement will continue to grow.

Danielle Stuewe
Wichita, Kansas

Apologeia on Vandy Episode

As the target of Kenneth Oldfield's critique ("Philosophers and Psychics: The Vandy Episode," November/December 2001), let me say at the outset—as loudly and clearly as possible—that I plead guilty to all charges; please accept my mea culpas. I can offer no justification, much less an excuse, for there is no justification or excuse. I can, however, offer at least a (partial) explanation of how I was led astray to begin with.

In some ways, I think it is a result of an occupational hazard in philosophy. It is not so much a case of hasty generalization (deriving sweeping statements on the basis of relatively few instances) but, for lack of a better term, "hasty hypothesizing." In the case of most conditional propositions, a philosopher is often far more interested in the consequent (i.e., the *then* clause) and not sufficiently attentive to the antecedent (the *if* clause).

The philosopher is so excited about developing and pursuing possible explanations, comparing and contrasting his account with those out there competing in the marketplace, demonstrating the virtues and explanatory power of his own vis a vis the others, and so on, that he virtually ignores the antecedent to begin with. Thus, in the present case, *if* there is anything to alleged cases of medium telepathy, *then* . . . what follows? The philosopher is then in his element and off and running!

In short, I have been sufficiently chastised. From now on I will try to exercise a greater degree of "philosophical restraint."

Arthur R. Miller
Professor of Philosophy
University of Texas at San Antonio
San Antonio, Texas

Guardians of Science?

It is a tad ironic that so many self-proclaimed "guardians of science" are questionably good scholars.

On page 35 on Phillips Stevens's article, "Magical Thinking in Complementary and Alternative Medicine," (November/December 2001) he quoted from one of my books, *Discovering Homeopathy: Medicine for the Twenty-first Century*, saying that I asserted that homeopathy is "too scientific" for ordinary people to figure out. The entire paragraph that is the source of the reference says:

> It is inevitable that some people who become interested in homeopathy will seek to find the homeopathic medicine for specific diseases. They will want to know what medicine is good for headaches, arthritis, premenstrual conditions, insomnia, or a host of other conditions. Homeopathy is actually too scientific for one to assume that there is a single medicine appropriate for everyone. In homeopathy it is essential that the medicine be individually prescribed for the sick person.

I have written numerous books that instruct health professionals and consumers alike on how to use homeopathic medicines for common acute ailments, though I also educate them on the limitations of using homeopathic medicines for serious or chronic ailments unless one is adequately trained in homeopathy. I have never said or implied that homeopathy is "'too scientific' for ordinary people to figure out."

I'm afraid that Phillips Stevens is pulling a rabbit out of thin air here. It doesn't work.

Dana Ullman, M.P.H.
Homeopathic Educational Services
Berkeley, California

Phillips Stevens replies to Ullman:

In this context my criticism was with Mr. Ullman's apparent meaning of "scientific"; but it seems to me that by quoting his entire paragraph he is both affirming my point and clarifying to the reader just what it is that the ordinary person can't figure out. Ullman says that homeopathy is "too scientific" for the client to be able to know which preparation is appropriate for which ailment—and his language here implies that "scientific" means "complicated." In fact, there is nothing at all scientific about homeopathy; it rests entirely upon magical principles. And it is in this very passage that I base my observation (n. 4, p. 37) about the prescience in Ullman's warning to people not to self-prescribe—in their 1998 JAMA *article Eisenberg and colleagues reported that use of homeopathy was up, but visits to homeopaths had declined by half. The only explanation for this is that the availability of ready-to-use homeopathic preparations, sold "over the counter" in commercial establishments, had increased.*

Phillips Stevens, Jr., Ph.D.
Department of Anthropology
SUNY at Buffalo
Buffalo, New York

After-Death Communications?

Regarding "A Critique of Schwartz et al.'s After-Death Communication Studies" (November/December 2001, p. 26), I took the liberty of searching for any after-death ancestors of Gary Schwartz on the many genealogical sites on the Internet. Surely the

author of the study should know his own pedigree and be sure of its validity by soliciting after-death communications from the mediums he investigated.

On the Gendex Web site, of the 3,244 Schwartz individuals listed, only three have given names of Gary, but none give their ancestry beyond their parents. On the Genforum Schwartz Family Web site, no one named Gary Schwartz sent or received any messages. On http://worldconnect.rootsweb.genealogy.com, there are twenty pedigrees that list Gary Schwartz, but of these, only seven know their parents and only one gives Schwartz ancestors beyond four generations.

As the registrar of a chapter of the SAR (Sons of the American Revolution) I help applicants trace their lineage back to Revolutionary Patriots. I could surely use a medium to find birth and death dates and places back seven or eight generations. A Jacob Schwartz and a Samuel Schwartz fought in the Revolution in Pennsylvania. Can Gary Schwartz can trace his ancestry back to one of them?

Blanchard Smith
Alexandria, Virginia

Good Work Fighting Frauds and Irrationality

In 1988 I was researching for a technical report in a university library when I happened to see several issues of a magazine called SKEPTICAL INQUIRER on a bottom shelf. I sat down right there on the floor to read a few and became instantly hooked. Thanks to your magazine, I have had hundreds of hours of enjoyable and thought-provoking reading in the years since.

As an engineer, I like the technical style of many of the articles, but I found the essay "Never a Dull Moment" by Barry Karr in the November/December 2001 issue worth writing to you about. His personal sadness at witnessing the disappointment of the parents of the handicapped baby who was not cured by Peter Popoff and the guilt of the lady in the wheelchair who believes a lack of faith keeps her in poor condition are similar to the reasons behind my support of your cause. It bothers me a great deal that certain individuals or groups make a shameful living by taking advantage of good people who are emotionally troubled.

I am glad CSICOP has the resources to help end the activities of frauds. Judging by the increasing belief in the irrational, your work cannot be getting easier. My point is that I hope all of you maintain the same desire as Mr. Karr. Please keep up the good work.

Jason L. Kekic
Bedford, Ohio

Rare Earth or Life Elsewhere?

I was baffled by David Darling's apparent outrage at Guillermo Gonzalez's "hidden agenda" behind the Rare Earth Hypothesis ("Was the 'Rare Earth' Hypothesis Influenced by a Creationist?" by Kendrick Frazier, News & Comment, November/December 2001).

The Rare Earth Hypothesis (REH) is a scientific theory, and it will stand or fall on how it performs under peer review by other scientists. Gonzalez's creationist beliefs have led him to compile evidence in support of REH, and any such compilation is a service to the scientific community involved in the debate. Darling seems to be suggesting that REH would never have got off the ground had it not been for Gonzalez's advocacy. Does he seriously believe that a portion of the scientific community has been brainwashed by Gonzalez into believing a theory they would otherwise find implausible? Or that debate and discussion of REH is in some way dangerous because it comes tainted by association with creationism? Or that no real scientist has ever developed a blinkered enthusiasm for a pet theory? Because these are the things he must believe in order to justify his denunciation of Gonzalez. And if he doesn't believe these things, then he should follow his own advice that, "Most of the time [religion] isn't relevant or, frankly, anyone's business."

Grant Hutchison
Dundee, United Kingdom

David Darling responds:

To quote from the chapter in my book Life Everywhere *on this topic:*

> *There's nothing intrinsically wrong with starting from an assumption of intelligent design and setting out to prove it scientifically. In the end, a scientist's personal beliefs are irrelevant because science is a communal, peer-reviewed venture in which belief is always subordinate to data. By drawing so much attention, the Rare Earth Hypothesis has laid itself, and the case for intelligent design, open to scientific scrutiny. As John Stuart Mill pointed out, nothing will expose the weaknesses of a bad idea (or, one might add, the strengths of a good one) faster than its wide dissemination. With the issue in plain view, it now comes down to observation.*

Perhaps Mr. Hutchison should do a little more homework in the future before jumping to conclusions about other people's beliefs.

In his article "Was the 'Rare Earth' Hypothesis Influenced by a Creationist?" (November/December 2001), Frazier describes how astronomer David Darling attempts to discredit the argument made by the authors of *Rare Earth* by demonstrating that they were heavily influenced by a colleague who had, unbeknownst to them, strong religious convictions concerning intelligent design. However, Darling himself seems to present no definitive evidence that life is, in fact, commonplace beyond Earth.

Without such evidence, one need not be a creationist—or even duped by a creationist—to reject the claim of extraterrestrial life outright.

Spencer Hunter
Tucson, Arizona

Kendrick Frazier replies to Hunter:

That wasn't the point of my News & Comment article. Most of David Darling's book Life Everywhere *argues strongly for the likelihood of life elsewhere in the universe. This is a viewpoint widely shared among many scientists. Even Ward and Brownlee agree: they just don't believe complex life (like us) is widespread. Despite all that, there is as yet no scientific claim for the discovery of extraterrestrial life—so there is no claim to reject, outright or otherwise. That we have not discovered it yet (we've barely begun) does not make the subject unscientific.*

Egg on (Mars) Face

Richard C. Hoagland has egg on his face ("Mars 'Face' Dwindles in New Spacecraft Images," News & Comment, September/October 2001). When Art Bell told him that he should admit defeat, then Richard should have thrown in the towel. I actually feel sorry for Richard; he was so brazen and confident in his theory. I will never forget how they showed Richard carrying some books, wearing an ankle-length coat, and confidently walking into an open forum to discuss the Face on Mars. Richard should have never pushed NASA to re-photograph the Face on Mars. Just think on how much money he could have made on more books, videotapes, and lectures on the subject. Now Richard is a public embarrassment.

Robert Crain, Jr.
Paradise, California

The Law and Junk Science

The November/December 2001 issue contains a letter to the editor and comment by an author recommending the book by David L. Faigman, *Legal Alchemy: The Use and Misuse of Science in the Law.* I have read this book very carefully and reviewed it in an English science journal, *Interdisciplinary Science Reviews,* vol. 25, no. 3 pps. 239–242. Although the purpose of the book is "to help lawyers and scientists better understand each other," it appears the author does not fully understand the nature of science nor the distinctive functions of science and law.

Details are expounded in the cited review, but a couple of examples will illustrate. Faigman writes that the witchcraft trials of 1692 in Salem, Massachusetts, "were solidly grounded in the science of the day" (33). This is factually not true, and within a few years after 1692 the legislature of Massachusetts reversed the witchcraft judgments and paid reparations to the heirs of defendants.

A confusion of concepts appears in Faigman's statement "Although science might one day 'prove' that all people are not created equal, the law need never accept such 'truth' . . ." (11). Of course the law says nothing about people's "genetic reality" (Faigman's term), but asserts only the principle that all persons are entitled to equal rights.

Unfortunately the book is accurately characterized by its anomalous title which refers to a pseudoscience of the Middle Ages.

Lee Loevinger
Washington, D.C.

Steven I. Dutch, in a recent letter in SI (November/December 2001), characterizes the behavior of those opposed to building more observatories on Mauna Kea as shameful and anti-intellectual. This is both absurd and insulting. Mauna Kea is the world's tallest mountain (as measured from the base). Besides having excellent observing conditions for telescopes at the summit, Mauna Kea is rich in archaeological, biological, cultural, esthetic, geological, and recreational resources (see www.hawaii.edu/maunakea/). In addition, the summit is part of the "ceded" lands in Hawai`i that are supposed to be used for the benefit of the Hawaiian people.

Under these circumstances, the desires of astronomers to exploit to the maximum extent possible the observational resources of Mauna Kea must be balanced against the needs of the other users, both scientists and nonscientists. The arrogant, self-serving, and blatantly unfair characterization by Professor Dutch of those that oppose his desires for the exploitation of Mauna Kea as anti-intellectual is exactly the sort of behavior that causes many people to distrust scientists and science.

John P. Wendell
Professor of Accountancy
University of Hawai`i at Manoa
Honolulu, Hawai`i

A Thank You; Writings Clarify a Great Deal for Me

As a result of reading the last three issues of SI, I got Martin Gardner's books *Did Adam and Eve Have Navels?* and *The Wild Side,* as well as your *The Hundredth Monkey* from the library.

In his introduction to *Adam and Eve,* Martin says of his writings ". . . if occasionally they help an open-minded reader to discard a crazy belief, they may do more than simply provide entertainment and laughter for skeptics."

These books have clarified a great deal for me. It would be almost impossible for me to find and sift through all of the paranormal and religious information condensed and commented on in these books. What a relief to find some common sense and historical perspective clearly set out in several volumes.

I am fifty, yet often wondering about the stuff you write about. I wondered about Carlos Castenada, not having been able to stomach the reading of a whole book of his, yet thinking maybe I was missing something. In one short essay, Martin pulls together the critical information and allows me to confirm my doubts.

Each new generation is born ignorant and asks the same questions. This is my experience, and is supported by the historical background information in these books. This knowledge is in itself reassuring and puts life in perspective. Then, to have someone collect the various answers and point out the more irrational ones, provides more relief.

I learned to trust authorities and adults, and it takes a bit of help to use my own common sense to evaluate the many nonscientific theories promoted by people holding themselves out with the same posture of authority and insight as those who actually deserve my trust.

Much of this stuff starts with a desire to find a protector and certainty in a God. I think we all have to find a way to live with the "spiritual quest for ultimate meaning." Here too, I found it reassuring to read "The Religious Views of Stephen Jay Gould and Darwin," a clear description of the basic purpose of science and religion, and Darwin's own dealing with the question of God. Some things just have no answer, and life goes ahead fine anyway. There is no need to resort to fantasy.

Thanks for your efforts.

Rolf Steng
Calgary, Alberta

On Being Stared At

Inspired by the exchange between Marks, Colwell, and Sheldrake (March/April 2001) I speculated that there might be a tendency to first guess "No-look" (N) in a session and then guess the opposite (the gambler's hunch against repetitions). I downloaded Sheldrake's random tables and conducted my own test using the critical first two sequences of twenty trials. By using my simple pattern of N-L-N-L-N for the first five trials and then assuming random results for the rest of each sequence I produced similar results that Sheldrake claims are caused by psychic detection. Here were my averaged results (50% being chance) based on how many times I used the pattern:

Three times (N-L-N) Total 55%,
Looking 57.5%, No-looking 53.75%.
Four times (N-L-N-L) Total 57.5%,
Looking 60%, No-looking 55%.
Five times (N-L-N-L-N) Total 57.5%,
Looking 62.5%, No-looking 54.17%.

Note the importance that the first two deviations from this pattern (fifth trial in the first sequence N-L-N-L-L, third trial in the second sequence N-L-L-L-N) are for a missed No-look. Their critical placement at the beginning of the sequence produced the artificial effect of my being able to more accurately "detect" Looks versus No-looks. This simple test provides further evidence that the critique of Sheldrake's research by Marks and Colwell is a valid one.

Andrew Alan Smith
Indianapolis, Indiana

The letters column is a forum for views on matters raised in previous issues. **Letters should be no more than 225 words.** Due to the volume of letters not all can be published. Address letters to Letters to the Editor, SKEPTICAL INQUIRER. Send by mail to 944 Deer Dr. NE, Albuquerque, NM 87122; by fax to 505-828-2080; or by e-mail to letters@csicop.org (include name and address).

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Write clearly, interestingly, and simply. Avoid unnecessary technical terms. Maintain a factual, professional, and restrained tone. All submissions are judged on interest, clarity, significance, relevance, authority, and topicality.

Direct critiques toward ideas and issues, not individuals. Be prepared to provide documentation of all factual assertions. A useful set of guidelines for those who seek to evaluate paranormal claims, titled "Proper Criticism" and written by Professor Ray Hyman, is available from the Editor. Among the guidelines: clarify your objectives, let the facts speak for themselves, be precise and careful with language, and avoid loaded words and sensationalism. State others' positions in a fair, objective, and nonemotional manner.

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Articles should have a title page. Begin with a succinct, inviting title followed by a concise, 20- to 30-word statement of the article's main point or theme. This "abstract" will be published in display type on the first page of the printed article and used as a summary on the Contents page. The title page should also give the name of the author(s), full addresses, and the lead author's office and home telephone numbers, fax number, and e-mail address, and a word count. At the end of the manuscript, include a suggested author note of one to three sentences that gives relevant affiliations and credentials and an address for correspondence. If you do not want your address included in the author note, please say so. The manuscript should be accompanied by a brief cover letter stating that the article has not been submitted elsewhere and providing any other essential background for the Editor.

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BELGIUM. Comité Belge Pour L'Investigation Scientifique des Phénomènes Réputés Pananormaux Comité Para, Belgium. J. Dommanget, President of the Committee. E-mail: omer.nys@oma.be. Observatoire Royal Belgique 3, ave. Circulaire B-1180, Brussels, Belgium. www.comitepara.be. **Studiekring voor Kritische Evaluatie van Pseudowetenschap en Paranormale beweringen** (SKEPP) Belgium. *Prof. Dr. W. Betz. Tel.: 32-2-477-43-11*; e-mail: skepp@skepp.be Laarbeeklaan. 103 B-1090 Brussels, Belgium. www.skepp.be.

BRAZIL. OPÇAO RACIONAL, Brazil. Luis Fernando Gutman. Tel.: 55-21-548-2476; e-mail: fernandogutman@hotmail.com. Rua Santa Clara, 431 Bloco 5, Apt. 803, Copacabana-Rio de Janeiro 22041-010 Brazil. www.opcaoracional.com.br.

BULGARIA. Bulgarian Skeptics, Bulgaria. Dr. Vladimir Daskalov. E-mail: egoshev@einet.bg. Krakra 22 BG-1504 Sofia, Bulgaria.

CANADA. Alberta Skeptics, Alberta. Greg Hart, Chairman. Tel.: 403-215-1440; e-mail: hartg@humaneffort.com. PO Box 5571, Station 'A', Calgary, Alberta T2H 1X9 Canada. http://abskeptics.homestead.com. **Alberta Skeptics, British Columbia Skeptics**, BC and Alberta. Lee Moller. Tel. 604-929-6299; e-mail: leemoller@home.com. 1188 Beaufort Road, N. Vancouver, BC V7G 1R7 Canada. **Ontario Skeptics**, Ontario, Canada. Eric McMillan, Chair. Tel.: 416-425-2451; e-mail: eric@we-compute.com. P.O. Box 53003, 10 Royal Orchard Blvd., Thornhill, ON L3T 7R9 Canada. www.astro.yorku.ca/~mmdr/oskeptics.html. **Toronto Skeptical Inquirers** (TSI) Toronto. Henry Gordon, President. Tel.: 905-771-1615; e-mail: henry_gordon@hotmail.com. 343 Clark Ave., W., Suite 1009, Thornhill, ON L4J 7K5 Canada. **Ottawa Skeptics**, Ottawa, Ontario. Greg Singer. E-mail: skeptic@ottawa.com. PO Box 1237, Station B, Ottawa, Ontario K1P 5R3 Canada.www.admissions.carleton.ca/~addalby/cats/skeptic.html. **Sceptiques du Quebec**, Quebec. Alan Bonnier. Tel.: 514-990-8099. C.P. 202, Succ. Beaubien Montreal, Quebec H2G 3C9 Canada. www.sceptiques.qc.ca.

CHINA. China Association for Science and Technology, China. Shen Zhenyu Research Center, P.O. Box 8113, Beijing China. **Hong Kong Skeptics**, Hong Kong. Brad Collins, P.O. Box 1010, Shatin Central Post Office, Shatin NT China.

COSTA RICA. Iniciativa para la Promoción del Pensamiento Crítico (IPPEC) San Jose. Victor Quiros V. Tel.: 506 275 43 52; e-mail: victorcr@racsa.co.cr. A.P. 1513-1002 Paseo de los Estudiantes San José, Costa Rica. http://webs.demasiado.com/vicr.

CZECHOSLOVAKIA. Sisyfos-Czech Skeptics Club. Czech Republic. Ms. Ing. Olga Kracikova, Secretary. Tel.: 420-2-24826691; e-mail: olgakracikova@email.cz. Hastalska 27 Praha 1 110 00 Czech Republic. www.fi.muni.cz/sisyfos/ (in Czech).

DENMARK. Skeptica: Association of Independent Danish Skeptics, Denmark. Willy Wegner. Tel.: 45-75-64-84-02; e-mail: skeptica@skeptica.dk. Vibevej 7 A DK 8700 Horsens, Denmark. www.skeptica.dk.

ECUADOR. Pablo Cevallos Estarellas. Apartado 09-*01-5603 Guayaquil, Ecuador.*

ESTONIA Horisont. Indrek Rohtmets. EE 0102 Tallinn, Narva mnt. 5.

FINLAND. SKEPSIS, Finland. Jukka Hakkinen. PO Box 483, Helsinki 00101 Finland.

FRANCE. AFIS, AFIS (Association Française pour l'Information Scientifique) France. Jean Bricmont, President. 14 rue de l'Ecole Polytechnique F-75005 Paris, France. **Cercle Zététique**, France. Paul-Eric Blanrue. 12 rue; David Deitz. F-57000 Metz, France. **Laboratoire de Zététique** (laboratory). Professeur Henri Broch. Tel.: 33-0492076312; e-mail: broch@unice.fr. Université de Nice-Sophia Antipolis Faculté des Sciences F-06108 Nice Cedex 2 France. www.unice.fr/zetetique/.

GERMANY. Gesellschaft zur wissenschaft lichen Unterrsuchung von Parawissenschaften (GWUP) Germany. Amardeo Sarma, Chairman. Tel.: 49-6154-695023. E-mail: info@gwup.org. Arheilger Weg 11 D-64380 Rossdorf, Germany. www.gwup.org. **European Council of Skeptical Organizations** (ECSO) Europe. Dr. Martin Mahner. Tel.: 49-6154-695023; e-mail: info@ecso.org. Arheilger Weg 11 64380 Rossdorf, Germany. www.ecso.org/.

HUNGARY. Tényeket Tisztelk Társasága TTT Hungary. Prof. Gyula Bencze. Tel.: 36-1-392-2728; e-mail: gbencze@rmki.kfki.hu. *c/o Természet Világa*, PO Box 246 H-1444 Budapest 8 Hungary.

INDIA. Atheist Centre, Dr. Vijayam, Executive Director. Benz Circle, Vijayawada 520 010, Andhra Pradesh, India. Tel.: 91 866 472330; Fax: 91 866 473433. E-mail: atheist@vsnl.com. **Maharashtra Andhashraddha Nirmoolan Samiti** (MANS) states of Maharashtra & Goa. Dr. Narendra Dabholkar, Executive President. Tel.: 91-2162-32333; e-mail: ndabholkar@hotmail.com. 155, Sadashiv Peth Satara 415001 India. www.antisuperstition.com. **Indian Rationalist Association**, India. Sanal Edamaruku. E-mail: edamaruku@yahoo.com. 779, Pocket 5, Mayur Vihar 1, New Delhi 110 091 India. Dravidar Kazhagam, southern India. K. Veeramani, Secretary General. Tel.: 9144-5386555; e-mail: periyar@vsnl.com. Periyar Thidal, 50, E.F.K. Sampath Road Vepery, Chennai Tamil Nadu 600 007 India. www.Periyar.org. **Indian CSICOP**, India, B. Premanand, Convenor. Tel.: 091-0422-872423; e-mail: dayamini@md4.vsnl.net.in. 11/7 Chettipalayam Road Podanur Tamilnadu 641 023 India.

ITALY. Comitato Italiano per il Controllo delle Affermazioni sul Paranormale (CICAP) Italy. Massimo Polidoro, Executive Director. Tel.: 39-049-686870; e-mail: polidoro@cicap.org. P.O. Box 1117 35100 Padova, Italy. www.cicap.org.

JAPAN. Japan Anti-Pseudoscience Activities Network (JAPAN) Japan. Ryutarou Minakami, chairperson. E-mail: skeptic@e-mail.ne.jp. *c/o* Ohta Publishing Company, Epcot Bld, 1F, 22, Arakicho, Shinjuku-ku Tokyo 160-8571 Japan. **Japan Skeptics**, Japan. Dr. Jun Jugaku. E-mail: jugakujn@cc.nao.ac.jp. Japan Skeptics, Business Center for Academic Societies, Japan 5-16-9 Honkomagome, Bunkyo-ku Tokyo 113-8622 Japan.

KAZAKHSTAN. Kazakhstan Commission for the Investigation of the Anomalous Phenomena (KCIAP) Kazakhstan. Dr. Sergey Efimov, Scientific Secretary. E-mail: efim@afi.south-capital.kz. Astrophysical Institute Kamenskoye Plato Alma-Ata, 480020 Republic of Kazakhstan. Committee for the Scientific Expertise of Claims of the Paranormal (CSECOP).

KOREA. Korea PseudoScience Awareness (KOPSA) Korea. Dr. Gun-Il Kang, Director. Tel.: 82-2-393-2734; e-mail: KOPSA@chollian.net. 187-11 Bukahyun-dong, Sudaemun-ku, Seoul 120-190 Korea www.kopsa.or.kr.

MALTA. Society for Investigating the Credibility of Extraordinary Claims (SICEC) Malta. Vanni Pule, Chairman. Tel.: 356-381994; e-mail: pulevan@vol.net.mt. P.O. Box 31, Hamrun, Malta.

MEXICO. Mexican Association for Skeptical Research (SOMIE) Mexico. Mario Mendez-Acosta, *Apartado Postal 19-546 D.F. 03900 Mexico.*

NETHERLANDS. Stichting Skepsis, Netherlands. Rob Nanninga, Secretary. Tel.: 31-50-3129893; e-mail: skepsis@wxs.nl. Westerkade 20, 9718 AS Groningen, Netherlands. www.skepsis.nl.

NEW ZEALAND. New Zealand Skeptics, New Zealand, Vicki Hyde, Chair. Tel.: 64-3-384-5136; e-mail: Vicki@spis.co.nz. PO Box 29-492, Christchurch, New Zealand. www.skeptics.org.nz.

NIGERIA. Nigerian Skeptics Society, Nigeria. Leo Igwe, Convenor. E-mail: dpc@skannet.com.ng. PO Box 25269, Mapo Ibadan Oyo State, Nigeria.

NORWAY. SKEPSIS. Norway St. Olavsgt. 27 N-0166 Oslo, Norway.

PERU. Comite de Investigaciones de lo Paranormal lo Seudocientifico y lo Irracional CIPSI-PERU, Lima, Peru. Manuel Abraham Paz-y-Mino. Tel.: +51-1-9215741; e-mail: cipsiperu@yahoo.com. El Corregidor 318 Rimac, Lima 25 Peru. www.geocities.com/cipsiperu.

POLAND. Polish Skeptics, Poland. Adam Pietrasiewicz. E-mail: redaktor@iname.com. www.biuletynsceptyczny.z.pl.

PORTUGAL. Associaçao Cépticos de Portugal (CEPO) Portugal. Ludwig Krippahl. E-mail: cepo@interacesso.pt. Apartado 334 2676-901 Odivelas, Portugal. http://cepo.interacesso.pt.

RUSSIA. Dr. Valerii A. Kuvakin. Tel.: 95-718-2178; e-mail: V.KUVAKIN@MTU-NET.RU. Vorob'evy Gory, Moscow State University, Phil. Dept. Moscow 119899 Russia. http://log.philos.msu.ru/rhs/index/htm.

SLOVAK REPUBLIC (SACT). Slovak Republic. Igor Kapisinsky Pavla Horova, 10 Bratislava 841 07 Slovak Republic.

SOUTH AFRICA. Marian Laserson. P.O. Box 46212, Orange Grove 2119 South Africa. **SOCRATES. South Africa. Cape Skeptics**, Cape Town. Dr. Leon Retief. Tel.: 27-21-9131434; e-mail: leonr@iafrica.com. 5N Agapanthus Avenue, Welgedacht Bellville 7530 South Africa.

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SWEDEN. Swedish Skeptics, Sweden. Dan Larhammar, professor chairperson. Tel.: 46-18-4714173; e-mail: vetfolk@physto.se. Medical Pharmacology BMC, Box 593, Uppsala 751 24 Sweden. www.physto.se/~vetfolk/index.html.

TAIWAN. Taiwan Skeptics, Taiwan. Tim Holmes, PO Box 195, Tanzu, Taiwan Perspective.

UNITED KINGDOM. *The Skeptic* Magazine, United Kingdom. Toby Howard. E-mail: toby@cs.man.ac.uk. P.O. Box 475 Manchester M60 2TH United Kingdom.

VENEZUELA. La Asociación Racional y Escéptica de Venezuela (A.R.E.V.), Guido David Nuñez Mujica, 10th Street, 13th av. corner, Mini centro comercial Oasis, Valera, Trujillo state, Venezuela. Web site: www.geocities.com/escepticosvenezuela.

United States

ALABAMA. Alabama Skeptics, Alabama. Emory Kimbrough. Tel.: 205-759-2624. 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 US. **Skeptics-Freethought Forum of Alabama**. Richard G. Davis. Tel: 256-751-4447; e-mail RRBama66@hotmail.com.

ARIZONA. Tucson Skeptics Inc. Tucson, AZ. James McGaha. E-mail: JMCGAHA@PimaCC.Pima.EDU. 5100 N. Sabino Foothills Dr., Tucson, AZ 85715 US. **Phoenix Skeptics**, Phoenix, AZ. Michael Stackpole, P.O. Box 60333, Phoenix, AZ 85082 US.

CALIFORNIA. Sacramento Organization for Rational Thinking (SORT) Sacramento, CA. Ray Spangenburg, co-founder. Tel.: 916-978-0321; e-mail: kitray@quiknet.com. PO Box 2147, Carmichael, CA 95609-2147 US. www.quiknet.com/~kitray/index1.html. **Bay Area Skeptics** (BAS) San Francisco—Bay Area. Tully McCarroll, Chair. Tel.: 415 927-1548; e-mail: tullyann@pacbell.net. PO Box 2443 Castro Valley, CA 94546-0443 US. www.BASkeptics.org. **Sacramento Skeptics Society**, Sacramento. Terry Sandbek, President. Tel.: 916-489-1774; e-mail: tsandbek@ispchannel.com. 4300 Auburn Blvd, Ste 206 Sacramento, CA 95841 US. http://my.ispchannel.com/~tsandbek/Skeptics/skeptics.htm. **San Diego Association for Rational Inquiry** (SDARI) San Diego, CA, county. Keith Taylor, President. Tel.: 619-220-1045; e-mail: krtaylorxyz@aol.com. 945 4th Ave. San Diego, CA 92101US.http://members.tripod.com/sdariweb/home.html.

COLORADO. Rocky Mountain Skeptics (RMS) Colo., Wyo., Utah, Mont. Béla Scheiber, President. Tel.: 303-444-7537; e-mail: rmscentral@mindspring.com. PO Box 7277, Boulder, CO 80306 US. http://bcn.boulder.co.us/community/rms.

CONNECTICUT. New England Skeptical Society (NESS) New England. Steven Novella MD, President. Tel.: 203-281-6277; e-mail: board@theness.com. PO Box 185526, Hamden, CT 06518-5526 US. www.theness.com.

D.C./MARYLAND. National Capital Area Skeptics NCAS, Maryland, D.C., Virginia. D.W. "Chip" Denman. Tel.: 301-587-3827. e-mail: ncas@ncas.org. PO Box 8428, Silver Spring, MD 20907-8428 US. http://www.ncas.org.

FLORIDA. Tampa Bay Skeptics (TBS) Tampa Bay, Florida. Gary Posner, Executive Director. Tel.: 813-584-0603; e-mail: tbskep@aol.com. 5319 Archstone Dr. #102, Tampa, FL 33634 US. http://members.aol.com/tbskep.

GEORGIA. Georgia Skeptics (GS) Georgia. Rebecca Long, President. Tel.: 770-493-6857; e-mail: arlong@hcrc.org. 2277 Winding Woods Dr., Tucker, GA 30084 US.

IOWA. Central Iowa Skeptics (CIS) Central Iowa, Rob Beeston. Tel.: 515-285-0622; e-mail: ciskeptics@hotmail.com. 5602 SW 2nd St. Des Moines, IA 50315 US. www.skepticweb.com.

ILLINOIS. Rational Examination Association of Lincoln Land (REALL) Illinois. David Bloomberg, Chairman. Tel.: 217-726-5354; e-mail: chairman@reall.org. PO Box 20302, Springfield, IL 62708 US. www.reall.org.

KENTUCKY. Kentucky Assn. of Science Educators and Skeptics (KASES) Kentucky. Prof. Robert Baker, 3495 Castleton Way, North Lexington, KY 40502 US. Contact Fred Bach at e-mail: fwbach@visto.com.

LOUISIANA. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM) Louisiana. Marge Schroth. Tel.: 225-766-4747 425 Carriage Way, Baton Rouge, LA 70808 US.

MICHIGAN. Great Lakes Skeptics (GLS) SE Michigan. Lorna J. Simmons, Contact person. Tel.: 734-525-5731; e-mail: Skeptic31@aol.com. 31710 Cowan Road, Apt. 103, Westland, MI 48185-2366 US. **Tri-Cities Skeptics**, Michigan. Gary Barker. Tel.: 517-799-4502, e-mail: barkerg@svol.org. 3596 Butternut St., Saginaw, MI 48604 US.

MINNESOTA. St. Kloud Extraordinary Claim Psychic Teaching Investigating Community (SKEPTIC) St. Cloud, Minnesota. Jerry Mertens. Tel.: 320-255-2138; e-mail: gmertens@stcloudstate.edu. Jerry Mertens, Psychology Department, 720 4th Ave. S, St. Cloud State University, St. Cloud, MN 56301 US. **Minnesota Skeptics**, Minnesota. Robert McCoy, 549 Turnpike Rd., Golden Valley, MN 55416 US.

MISSOURI. Gateway Skeptics, Missouri, Steve Best, 6943 Amherst Ave., University City, MO 63130 US. **Kansas City Committee for Skeptical Inquiry**, Missouri. Verle Muhrer, United Labor Bldg., 6301 Rockhill Road, Suite 412 Kansas City, MO 64131 US.

NEBRASKA. REASON (Rationalists, Empiracists and Skeptics of Nebraska), Chris Peters, PO Box 24358, Omaha, NE 68134; e-mail: reason01@hotmail.com; Web page: www.reason.ws.

NEW MEXICO. New Mexicans for Science and Reason (NMSR) New Mexico. David E. Thomas, President. Tel.: 505-869-9250; e-mail: det@rt66.com. PO Box 1017, Peralta, NM 87042 US. www.nmsr.org.

NEW YORK. New York Area Skeptics (NYASk) metropolitan NY area. Ted W. Debiak, President. Tel.: 516-735-8739; e-mail: info@nyask.com. 57 South Windhorst Ave., Bethpage, NY 11714-4931 US. www.nyask.com. **Inquiring Skeptics of Upper New York** (ISUNY) Upper New York. Michael Sofka, 8 Providence St., Albany, NY 12203 US.

NORTH CAROLINA. Carolina Skeptics North Carolina. Eric Carlson, President. Tel.: 336-758-4994; e-mail: ecarlson@wfu.edu. Physics Department, Wake Forest University, Winston-Salem, NC 27109 US. www.carolinaskeptics.org.

OHIO. Central Ohioans for Rational Inquiry *(CORI) Central Ohio. Charlie Hazlett, President.* Tel.: 614-878-2742; e-mail: charlie@hazlett.net. PO Box 282069, Columbus OH 43228 US. **South Shore Skeptics** (SSS) Cleveland and counties. Jim Kutz. Tel.: 440 942-5543; e-mail: jimkutz@earthlink.net. PO Box 5083, Cleveland, OH 44101 US. www.southshoreskeptics.org/. **Association for Rational Thought** (ART) Cincinnati. Roy Auerbach, president. Tel: 513-731-2774, e-mail: raa@cinci.rr.com. PO Box 12896, Cincinnati, OH 45212 US. www.cincinnatiskeptics.org.

OREGON. Oregonians for Rationality (O4R) Oregon. Dave Chapman, President. Tel.: 503 292-2146, e-mail: dchapman@iccom.com. 7555 Spring Valley Rd. NW, Salem, OR 97304 US. www.o4r.org.

PENNSYLVANIA. Paranormal Investigating Committee of Pittsburgh (PICP) Pittsburgh PA. Richard Busch, Chairman. Tel.: 412-366-1000; e-mail: mindful@telerama.com. 8209 Thompson Run Rd., Pittsburgh, PA 15237 US. **Philadelphia Association for Critical Thinking** (PhACT), much of Pennsylvania. Eric Krieg, President. Tel.: 215-885-2089; e-mail: eric@phact.org. PO Box 1131, North Wales, PA 19454 US. www.phact.org/phact.

TENNESEE. Rationalists of East Tennessee, East Tennessee. Carl Ledenbecker. Tel.: 865-982-8687; e-mail: Aletall@aol.com. 2123 Stonybrook Rd., Louisville, TN 37777 US.

TEXAS. North Texas Skeptics NTS Dallas/Ft Worth area, John Blanton, Secretary. Tel.: 972-306-3187; e-mail: skeptic@ntskeptics.org. PO Box 111794, Carrollton, TX 75011-1794 US. www.ntskeptics.org.

VIRGINIA. Science & Reason, Hampton Rds., Virginia. Lawrence Weinstein, Old Dominion Univ.-Physics Dept., Norfolk, VA 23529 US.

WASHINGTON. Society for Sensible Explanations, Western Washington. Tad Cook, Secretary. E-mail: k7vw@arrl.net. PO Box 45792, Seattle, WA 98145-0792 US. http://seattleskeptics.org.

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SCIENTIFIC AND TECHNICAL CONSULTANTS

George Agogino, Dept. of Anthropology, Eastern New Mexico University
Gary Bauslaugh, educational consultant, Center for Curriculum, Transfer and Technology, Victoria, B.C., Canada
Richard E. Berendzen, astronomer, Washington, D.C.
Martin Bridgstock, lecturer, School of Science, Griffith University, Brisbane, Australia
Richard Busch, magician/mentalist, Pittsburgh, Penn.
Shawn Carlson, Society for Amateur Scientists, East Greenwich, CT
Roger B. Culver, professor of astronomy, Colorado State Univ.
Felix Ares de Blas, professor of computer science, University of Basque, San Sebastian, Spain
Michael R. Dennett, writer, investigator, Federal Way, Washington
Sid Deutsch, consultant, Sarasota, Fla.
J. Dommanget, astronomer, Royale Observatory, Brussels, Belgium
Nahum J. Duker, assistant professor of pathology, Temple University
Barbara Eisenstadt, psychologist, educator, clinician, East Greenbush, N.Y.
William Evans, professor of communication, Georgia State University
John F. Fischer, forensic analyst, Orlando, Fla.
Robert E. Funk, anthropologist, New York State Museum & Science Service
Eileen Gambrill, professor of social welfare, University of California at Berkeley
Sylvio Garattini, director, Mario Negri Pharmacology Institute, Milan, Italy
Laurie Godfrey, anthropologist, University of Massachusetts
Gerald Goldin, mathematician, Rutgers University, New Jersey
Donald Goldsmith, astronomer; president, Interstellar Media
Alan Hale, astronomer, Southwest Institute for Space Research, Alamogordo, New Mexico
Clyde F. Herreid, professor of biology, SUNY, Buffalo
Terence M. Hines, professor of psychology, Pace University, Pleasantville, N.Y.
Michael Hutchinson, author; SKEPTICAL INQUIRER representative, Europe
Philip A. Ianna, assoc. professor of astronomy, Univ. of Virginia
William Jarvis, professor of health promotion and public health, Loma Linda University, School of Public Health
I. W. Kelly, professor of psychology, University of Saskatchewan
Richard H. Lange, M.D., Mohawk Valley Physician Health Plan, Schenectady, N.Y.
Gerald A. Larue, professor of biblical history and archaeology, University of So. California.
William M. London, consumer advocate, Fort Lee, New Jersey
Rebecca Long, nuclear engineer, president of Georgia Council Against Health Fraud, Atlanta, Ga.
Thomas R. McDonough, lecturer in engineering, Caltech, and SETI Coordinator of the Planetary Society
James E. McGaha, Major, USAF; pilot
Joel A. Moskowitz, director of medical psychiatry, Calabasas Mental Health Services, Los Angeles.
Jan Willem Nienhuys, mathematician, Univ. of Eindhoven, the Netherlands
John W. Patterson, professor of materials science and engineering, Iowa State University
James Pomerantz, Provost, and professor of cognitive and linguistic sciences, Brown Univ.
Gary P. Posner, M.D., Tampa, Fla.
Daisie Radner, professor of philosophy, SUNY, Buffalo
Michael Radner, professor of philosophy, McMaster University, Hamilton, Ontario, Canada
Robert H. Romer, professor of physics, Amherst College
Karl Sabbagh, journalist, Richmond, Surrey, England
Robert J. Samp, assistant professor of education and medicine, University of Wisconsin-Madison
Steven D. Schafersman, asst. professor of geology, Miami Univ., Ohio
Béla Scheiber,* systems analyst, Boulder, Colo.
Chris Scott, statistician, London, England
Stuart D. Scott, Jr., associate professor of anthropology, SUNY, Buffalo
Erwin M. Segal, professor of psychology, SUNY, Buffalo
Carla Selby, anthropologist/archaeologist
Steven N. Shore, professor and chair, Dept. of Physics and Astronomy, Indiana Univ. South Bend
Waclaw Szybalski, professor, McArdle Laboratory, University of Wisconsin-Madison
Ernest H. Taves, psychoanalyst, Cambridge, Mass.
Sarah G. Thomason, professor of linguistics, University of Pittsburgh
Tim Trachet, journalist and science writer, honorary chairman of SKEPP, Belgium.

*Member, CSICOP Executive Council
°Associate Member, CSICOP Executive Council

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METRO NEW YORK
Walnut and Green, 89 Walnut Street
Montclair, NJ 07042
Tel.: (973) 655-9556

FRANCE
Prof. Henri Broch,
Universite of Nice
Faculté des Sciences
Parc Valrose, 06108
Nice cedex 2. France
www.unice.fr/zetetics/

PERU
D. Casanova 430, Lima 14, Peru

EUROPE
Dr. Martin Mahner
Arheilger Weg 11, D-64380 Rossdorf, Germany
Tel.: +49 6154 695023

MOSCOW
Professor Valerii A. Kuvakin
119899 Russia, Moscow, Vorobevy Gory,
Moscow State University,
Philosophy Department

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Chandra Takes in Bright Lights, Big City of Milky Way

This 400 by 900 light-year mosaic of several Chandra X-ray Observatory images of the central region of our Milky Way galaxy reveals hundreds of white dwarf stars, neutron stars, and black holes bathed in an incandescent fog of multimillion-degree gas. The supermassive black hole at the center of the galaxy is located inside the bright white patch in the center of the image. The colors indicate X-ray energy bands—red (low), green (medium), and blue (high). NASA issued this image January 9, 2002.

Credit: NASA /UMass/D. Wang et al.

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